RAILWAY AGE

Beginning of 1932 Marked Turn of the Tide

By the Editor

New Year's day, 1932, was more than a mere date printed upon a calendar in the history of the railroads of the United States. It will be long referred to as marking approximately the time, when in the greatest crisis in railway history, the tide turned, and the earning capacity of the railroad industry ceased to decline and began to increase. As it will be recalled as marking the turn of the tide in railway affairs, so it will probably be recalled as marking the turn of the tide in the longest and most profound depression ever known in American business.

Toward the end of 1931 the financial condition of the railways presented the most serious and dangerous problem that had developed during the Great Depression. At the beginning of the New Year the tide had turned in their affairs because there was going into effect an increase of $100,000,000 or more annually in their freight rates, which had been authorized by the Interstate Commerce Commission, and there was in immediate prospect a reduction, for one year, of 10 per cent in the average wage paid by them which, upon the basis of the payroll of 1931, would save them about $215,000,000.

Assuming an increase in freight business, the total benefit derived by the railways from these changes would exceed the aggregate of about $315,000,000 indicated by the figures; and a slight improvement in freight business actually was occurring. In September car loadings were 22 per cent less than in 1930 and 36 per cent less than in 1929. In October they were 19½ per cent less than in 1930 and 34.3 per cent less than in 1929. In November they were 18.6 per cent less than in 1930 and 31.3 per cent less than in 1929. The improvement shown was very small, but it indicated definitely that the long decline which began in October, 1929, and continued without interruption until the end of September, 1931, had at last stopped.

The 10 per cent reduction in wages had not yet been agreed upon, but the appointment of committees to represent the railway labor organizations and the railways in negotiations regarding both unemployment and wages had been brought about in a way which indicated that a reduction of wages in a short time was virtually certain. Every well-informed person, including railway labor leaders, realizes that failure of the negotiations to result in a reduction of wages would be a severe blow, at this critical time, to the entire business structure of the country, and would prolong the depression and increase unemployment. Therefore, such failure seems very improbable.

Improvement in Employment and Purchases

An advance in freight rates and an early reduction of wages will not only save many railways from financial disaster, but will also result in increases of employment and purchases by the railways. An increase in their purchases will increase production and employment by manufacturers of railway equipment and materials, and the beneficial effects will ramify throughout the entire country. Under normal conditions the annual purchases of the Class I railways of the United States from manufacturers amount to about $1,350,000,000 and from producers of fuel to about $350,000,000, a total of $1,700,000,000. In 1931 their purchases from manufacturers amounted to about $639,000,000, and from producers of fuel to about $224,000,000, a total of about $863,000,000, or a reduction of about $840,000,000, or almost 50 per cent. No one other thing could do more to help general business than an increase in the earning capacity of the railroads and its use to prevent railroad bankruptcies and to increase employment and purchases.

The year 1931 will, it is to be hoped, stand out forever as the worst in railroad history. The total earnings of the Class I roads were about $4,246,500,000, or about $1,100,000,000 less than in 1930 and about $2.-

100,000,000 less than in 1929. This vast decline was due to losses of revenue from every kind of traffic. It was three times as great as the decline that occurred in the depression of 1921-1922, and made total earnings the smallest since 1917. Freight business was about 30 per cent less than in 1929 and about 20 per cent less than in 1930, and during the second half of the year was actually less than in 1921, although both were years of depression. Passenger business was 17.8 per cent less than in 1930, 29 per cent less than in 1929, and 53 per cent less than in 1920.

Reductions of Expenditures in 1931

Total operating expenses were about $3,262,300,000, a reduction of about $713,400,000 as compared with 1930 and of about $1,298,500,000 as compared with 1929. Net operating income was about $552,900,000, a reduction of about $332,100,000 as compared with 1930 and of about $721,700,000 as compared with 1929. It was about $63,000,000 less than in 1921, the last year of severe depression, and was the smallest amount earned since 1901 excepting when the war-time guarantees were in effect.

It is hardly necessary to say that the gigantic reduction of operating expenses effected was accomplished mainly by the most drastic retrenchments in maintenance. Expenditures for maintenance of equipment were about $202,000,000 less than in 1930 and about $388,000,000 less than in 1929. Expenditures for maintenance of way were about $173,000,000 less than in 1930 and about $324,000,000 less than in 1929. Total expenditures for all maintenance were thus about $375,000,000 less than in 1930, a reduction of 22 per cent, and $712,000,000 less than in 1929, a reduction of 34 per cent.

Physical Properties Deteriorate

To say that the physical properties of the railways have deteriorated because of the huge reductions of maintenance expenditures would be merely to state the obvious, although no available figures indicate comprehensively the extent of this deterioration. The number of locomotives reported as in bad order on November 1 was only 12.0 per cent, but if those held out of service for running repairs had been included, as they were up to September 1, 1930, the figure would have exceeded 22 per cent, and been the worst reported since the latter part of 1922, during the shop employees' strike. The number of freight cars reported as in bad order was 9 per cent, or the largest, excepting in September, 1924, since June 1, 1923. There is a well-known tendency to make bad order reports as favorable as possible during periods of retrenchment. Therefore, it is safe to say that equipment generally is in the worst condition, excepting during the shop crafts strike in 1922, since the railroads were returned to private operation in 1920.

This condition is obscured now by the fact that in handling a small volume of freight business it is not necessary to use as much equipment as normally, but it will become plain enough when traffic increases.

One reason why the railways were able to effect such drastic retrenchments in maintenance in 1931, and at the same time render as good service as they did, was that they made unusually large capital expenditures in 1930 in accordance with their promise to President Hoover to contribute all they could toward alleviating and abbreviating the depression. Their capital expenditures of almost $873,000,000 in 1930 were the largest since 1926, and resulted, among other things, in the installation of 782 new locomotives and 76,909 freight cars. Capital expenditures were reduced relatively as much in 1931 as maintenance expenditures, and the number of new locomotives placed in service was only 133 and the number of freight cars only 12,707. Final figures undoubtedly will show that the amount of new and rebuilt equipment placed in service last year was the smallest in any year for which statistics are available. The number of locomotives ordered during the year was only 235; freight cars, 10,880; and passenger cars, 11. The smallest orders ever reported before were those placed in 1919, under government operation, and were, locomotives, 214; freight cars, 22,062; and passenger cars, 306.

Motive Power Trends

If measuring by the volume of orders placed during the year, one would be forced to the conclusion that progress in motive power and rolling stock was nearer to a complete standstill in 1931 than in any previous year in railroad history. This is, however, not a true index of progress affecting the future efficiency and capacity of the railroads for rendering a service in keeping with modern commercial requirements.

Two noteworthy events are in the record of 1931 locomotive progress. These are the completion of the two multi-pressure locomotives, one for the Canadian Pacific and one for the New York Central, the design of which was the joint project of the Superheater Company, the American Locomotive Company, and the respective railroads. This event marks the distinctive entrance into a field of truly high pressures in American locomotive design, requiring radical departures in proportions, arrangement and details of construction from conventional practices. The second event was the recent completion by the American Locomotive Company of two Hudson type locomotives for the New York Central which, with the exception of the trailer axles, have complete installations of roller bearings on all axle journals. These two locomotives both have SKF engine trucks. One has SKF bearings and the other Timken bearings on the driving-axle and tender-axle journals. They are the first steam locomotives with driving axles so equipped which have been purchased by any railroad.

The past year has seen a widespread increase of interest in the application of air conditioning to passenger cars and the development of several new sys-

tems by which it can be effected. From a development of this character, once inaugurated, there is no turning back. The extent to which it has demonstrated its ability to remove two of the principal discomforts of railway travel—heat and dust—has already created a widespread public desire for it which must be served.

New Era in Freight Equipment

The events of the past year mark the beginning of a new era in the development of rolling stock for freight transportation. The action of the Interstate Commerce Commission in permitting departures from the conventional tariff structure, to aid the railroads in their efforts to meet the competition of motor trucks on the highways, has opened an entirely new field for the exercise of initiative and ingenuity by railway managements in providing new forms of transportation service which will undoubtedly grow steadily in importance. These forms of service require the use of demountable containers, several types of which are already well developed. It would be difficult to predict the extent of the influence this movement may have on the character of railway rolling stock or just what form the new rolling stock ultimately may assume. That this influence will be large and that it will effect great changes in practice may, however, be stated with confidence.

The quality of the service which motive power and rolling stock is still rendering, after many months of extremely drastic curtailments of expenditures for maintenance, is evidence of the high standards of maintenance which had been in effect for several years prior to the advent of the general business depression. With the limited volume in which materials and appliances needed to maintain rolling stock have been purchased during the past year, however, few of the locomotives and cars now in storage will be found in condition for immediate service when need for their use arises.

Construction Activities in 1931

While the railways made heavy expenditures for construction purposes in 1931, the total amount spent fell considerably below that for 1930, the contrast being more sharply defined by reason of the fact that 1930 marked the climax of almost a decade of intensive development of railway facilities. Many of the more important projects that were in progress during the year were carried over from previous years. In recent years, the number of new projects that were started has largely offset those that were completed. In 1931, however, the amount of work completed far exceeded that undertaken, so that present indications point to a further sharp curtailment in 1932 in both internal improvements and new lines.

Confirming the forecast made a year ago, a larger mileage of new lines was completed during 1931 than in 1930. A total of 748 miles of new lines was completed and placed in service, or 235 miles more than in 1930. This was a greater mileage than was completed in any year between 1917 and 1925, while it has been exceeded only three times since 1917. The number of new lines under construction or projected at the end of the year was less than in any recent year, the prospect being that the new mileage completed in 1932 will be the smallest since 1893.

The mileage of second, third and fourth main tracks built in 1931 dropped sharply, although this was a continuation of the trend of recent years. This is explained largely by the fact that recent improvements in equipment and methods for directing and controlling train movements have so increased the operating capacity of main tracks as to make unnecessary additional traffic lanes. Grade separations continued to exact a heavy toll from the railways, the ratio of this form of capital expenditure to the total having risen sharply during 1931.

In Canada 250 miles of new lines were built in 1931, as compared with 385 miles in 1930, being the smallest mileage completed since 1922. With the exception of that year and of 1917 and 1918, it was also the lowest since 1904. In Mexico, railway construction remained practically at a standstill, only 4.2 miles being completed in 1931, while there is little prospect of construction activity in the near future.

Closely allied with construction activities is the abandonment of lines that have outlived their usefulness. The difficulties which are besetting many small roads and branch lines of larger systems were reflected in the increase of 101 miles of lines abandoned last year, the total for the year being 795 miles, as compared with 694 miles in 1930. This is 47 miles in excess of the mileage of new lines completed, and compares with a net decrease of 181 miles of main lines in 1930 and a net increase of 91 miles in 1929 and of 513 miles in 1928.

Maintenance of Way and Structures

In the first 10 months of 1931, the Class I railways spent $470,724,273 for maintenance of way and structures, as compared with $620,090,685 and $737,344,717 in the corresponding periods of 1930 and 1929, respectively. In other words, their expenditures were 24.1 per cent less than in the same period of 1930 and 36.2 per cent less than in 1929. The number of men employed in the maintenance of roadway and structures in the first nine months of 1931 ranged from 260,900 in February to 310,044 in June, compared with a minimum of 274,479 men in December, 1930, and a maximum of 408,042 in May, 1930. However, a more significant comparison of maintenance of way operations in 1931 with those of previous years is afforded by the fact that the maximum expenditure in any month in that year, namely, $59,008,782 in June, was only $3,997,000 more than the lowest expenditure in any month between January, 1925, and December, 1929, and that the average monthly outlay in the first 10 months of 1931 was less than in any individual month between February, 1922, and November, 1930.

The disparity was even more marked with respect to employment, as the maximum force in 1931—310,044 men—was smaller than that employed in any month between January, 1922, and February, 1930. In other words, maintenance of way operations have been substantially on a "winter basis" since October, 1930. The total expenditure for maintenance of way in 1931, estimated in the neighborhood of $540,000,000, was lower than for any year since 1917.

Because the railways were in excellent physical condition in the fall of 1929, because the subsequent decline in traffic resulted in an appreciable reduction in wear and tear, and because the protracted drought gave rise to an abnormal solidification of roadbeds, the sharp curtailment of maintenance operations in 1930 was attended by no serious depreciation of tracks and structures during that year. By concentrating activities on upkeep rather than on normal replacements, it has been possible for the railways to go through a second year of even more restricted expenditures with no serious evidences of the deterioration that has occurred. It is necessary to bear in mind, however, that adherence to this policy has resulted in an accumulation of deferred renewals which cannot be postponed indefinitely.

Improvements in Maintenance Facilities and Practice

Notwithstanding decreased appropriations for maintenance of way and structures, improvements in practice have continued, so that 1931 was not without its far-reaching developments. Chief among these was the adoption of the 152-lb. rail section by the Pennsylvania for its heavy-traffic lines. Another innovation, the product of several years of experimental work by the Milwaukee, is the practice of heat-treating the ends of rails to increase their resistance to flow and batter of the surface metal. Among changes in the organization of track forces, which has been under critical scrutiny for several years, is that adopted by the Burlington on all of its lines west of the Missouri river. This embodies the employment of inspector-supervisors, who not only function as track patrolmen, but provide a much closer check on the day-to-day performance of the section gangs than is possible with the supervision usually provided.

Continued progress has been made by the manufacturers in the development of new and improved labor-saving equipment, and more new power tools and machines were introduced during the year than in any equal period in the past decade.

Signaling Progress in 1931

The volume of signaling facilities placed in service during 1931 approximated 61 per cent of that for 1930. The number of interlockings was about equal to that for the previous year, but the mileage of road equipped with automatic block signals was only about 40 per cent of that so protected in 1930. Most of the carriers followed active programs of automatic highway crossing protection during 1931, over 1,136 crossings, involving 2,368 signals and 34 gates, being so protected, as compared with about 1,300 crossings using 2,984 signals and 46 gates during the previous year. The use of the new A. R. A. standard "STOP" signs in connection with many of the signals was a development during the year. Continued favor was being shown for spring switches, 122 such installations being made in 1931, as compared with 152 in 1930.

During 1931 centralized traffic control assumed an increasingly important role in the reduction of operating expenses by reason of its three fundamental features, the direction of train movements by signal indication without written train orders, the automatic "OS"ing of trains, and the power operation of remotely controlled switches. Centralized control was installed during 1931 on 416 miles of line, involving 411 power-operated switches and 879 controlled signals.

Activities in automatic train control construction were limited to one 133-mile installation on the Michigan Central. It is not expected that the Interstate Commerce Commission will issue any further orders requiring train control installations in the near future. However, judging by the detailed investigations that are being made of operating conditions, and the repeated references to train control protection in reports of accident investigations, the commission is in no sense permitting the subject of automatic train control to be forgotten. On the other hand, during 1931, the Great Northern petitioned the commission for permission to remove the train control system on 229 miles of its main line between New Rockford, N. D., and Williston. No action has yet been taken by the commission, but it is rumored that several other roads on which continuous train control systems are in service are now investigating the practicability of eliminating the automatic train stop features and retaining only the cab signaling.

Advances in Freight Service

One of the outstanding features of the year was the speeding-up of freight service, particularly merchandise trains. This shortening of freight train schedules represents efforts by the railways to meet truck competition. Some notable examples of fast merchandise trains are the "Maine Bullet" operated by the Boston & Maine and the New Haven, which provides overnight delivery between Portland, Maine, and New York, and also between intermediate points; the "Speed Witch" operated in overnight service by the New Haven and the Pennsylvania between Boston and Baltimore; the "Blue Streak", which runs overnight between St. Louis and Texarkana and Shreveport, and which averages close to 40 miles an hour, including stops, between St. Louis and Pine Bluff; the "Merchandise Special" of the Missouri Pacific, which operates on a similarly fast schedule between St. Louis, Little Rock, Ark., Texarkana and Shreveport. On a

number of other roads, particularly in the west, it is quite common now to give overnight service on merchandise freight within a radius of 300 miles.

Another interesting event of 1931 was the action of the Pennsylvania, the Baltimore & Ohio, the Lackawanna and the Jersey Central in providing for the movement of truck bodies in the territory generally between New York and Richmond, Va., the latter point being reached through the Richmond, Fredericksburg & Potomac. This plan contemplates that competitive truck lines will ship their loaded truck bodies over the railways on overnight trains at rates which will be less than the cost of carrying the truck bodies over the road by truck and which will be sufficiently high to enable the railway to show a net on the operation.

Railroad Employment

The effects produced upon railroad employment in 1931 by the necessity of effecting every possible retrenchment can only be described as terrible. In 1920, the year in which they were returned to private operation, the railways had 2,054,160 employees and paid $3,734,000,000 in wages. The number had been greatly increased under government operation, and was further increased by the general establishment of the eight-hour day by the Railroad Administration just before the resumption of private operation. The number of employees in 1923 was 1,879,770. Owing to the decline of passenger traffic and to improvements in plants and operating methods, it slowly declined to 1,686,769 in 1929. Owing principally to the depression, it further declined in 1930 to 1,510,688, while in the first ten months of 1931 it approximated only 1,282,000. In 1929 the total pay roll was $2,941,000,000, in 1930 only $2,590,000,000 and in 1931 only about $2,117,000,000. It will be seen that the average number of employees in 1931 was about 405,000 less than in 1929, 598,000 less than in 1923, and 379,000 less than in 1921, during the last depression. It is not surprising, in view of these figures, that labor leaders and employees are seeking for ways to reduce unemployment of railroad men.

Causes and Remedies of Unemployment

It is significant that there was no complaint of general unemployment in this country in the years 1923-1929, while there was such complaint throughout the years 1930-1931. This is significant because there has been such lack of complaint during periods of prosperity, and such prevalence of complaint during years of depression, ever since the era of machine production began more than a century ago; and the causes to which unemployment has been attributed and the remedies proposed for it always have been the same. It has always been attributed chiefly to "over-production", and the principal remedy always proposed has been a reduction of hours of work. Labor leaders are simply making history repeat itself by advocating a permanent reduction of hours of work as a cure for the temporary unemployment caused by a depression.

There is always some unemployment in every country regardless of the extent of the use of modern machinery and methods in its industry. The one and only thing needed to reduce unemployment to normal in the United States is a restoration of business activity to normal. The problem of restoring business activity to normal is the problem of increasing the purchase and consumption of goods, and thereby increasing the effective demand for their production. Production in the United States is now about 40 per cent less than two years ago, and the problem of unemployment would be largely solved by the creation of an effective demand for products that would restore production to what it was two years ago.

Now, it would be ridiculous to say that the American people have reduced their effective demand for products 40 per cent because they actually want 40 per cent less goods. They want many more things now than they ever did. The average income of all American families, rich or poor, in 1929 was less than $3,000. Was there any American family with an income of, say, $2,500 that would then have opposed having it increased to $5,000? Does anybody doubt that if the average family had had its income doubled its expenditures would have been doubled? Does anybody believe that there would have been a "general over-production" if each family had bought, or tried to buy, twice as much as it actually did buy in 1929? Does anybody believe that the depression would continue owing to "over-production" if the American people should today suddenly have their buying power doubled?

Unemployment and Reduction of Working Hours

There never has been in the history of mankind any such thing as "general over-production", and certainly it cannot be said that unemployment is due at present to "over-production", when there is 40 per cent less production than two years ago, and virtually every family in the country is buying much less than it wants to. The depression has been caused, prolonged and deepened by belated effects of the great war, and by the effects of blunders made subsequently by leaders in public affairs, in business and in labor organizations throughout the world. The way to revive general business and employment is to remedy the effects of past mistakes and avoid similar mistakes in future.

To carry out the program of labor leaders to reduce hours of work in industry in general, and on the railways in particular, would be simply to make another huge mistake that would both delay the revival of business and prevent subsequent prosperity from being as great as it otherwise would be. This program contemplates six hours work for eight hours pay. The reduction of hours would, under normal conditions, reduce production and thereby reduce the total income of the American people, because total income is necessarily derived from total production. Eight hours pay

for six hours work would increase the average hourly wage 33⅓ per cent. This would increase cost of production in the industries in which the six-hour day was established, and reduce the demand for the products of these industries if the longer working day without any corresponding change in wages were maintained in other industries. If working hours were reduced and hourly wages increased in all industries the effects would be to reduce production and increase production costs in all industries. The products of each industry constitute its demand for the products of all other industries. Reduce the products of each industry, and there will be a reduction in the demand for the products of all industries. Reduce the demand for the products of all industries, and there will be no increase in employment. Therefore, while general reduction of hours of work will give more leisure, it will reduce production, reduce the national income and reduce what all the people can buy and have, but will not increase employment in periods of prosperity or reduce unemployment in periods of depression.

Unemployment on the Railroads

The causes of unemployment in the railroad industry are somewhat different from the causes of unemployment in American industry generally. Prior to 1920 there were constant improvements in railway plants and operating methods which caused increases in average output per employee; but there were also large increases in both passenger and freight traffic which caused increases in the demand for railway service that more than offset the effect of the increase in average output per employee, and in consequence there was a steady increase in the number of employees. The improvements in railway plants and operating methods made since 1920 have been relatively no greater, and the increase in the average output per employee has actually been less, than before; but passenger traffic has steadily declined, freight business has increased only one-seventh to one-tenth as much annually as prior to 1920, and, the effect of the increase in average output per employee not having been offset by the effects of the increases of traffic and of demand for railway service as formerly, there was a decline in the total number of employees between 1923 and 1929.

Railway labor leaders propose establishment of a six-hour day at eight hours pay to remedy the resulting unemployment of railway men. This, however, would cause a huge increase in railway operating expenses. If railway rates were correspondingly increased there would be a decline in the demand for railway service, because more traffic would be diverted to other means of transportation, and this would speedily reduce employment by the railroads. If rates were not increased to offset the increase in operating expenses all the railroads would be thrown into bankruptcy, and private management and private capital would retire from the field, because they will not stay in any industry that cannot be conducted at a profit. Government ownership would result, but it can hardly be believed that the taxpaying public would long consent to pay huge deficits incurred to enable railway employees to get eight hours pay for six hours work.

The only solution of the railroad problem in the interest of all concerned is to reduce operating expenses and taxes and increase earnings enough to enable the railways to pay a reasonable return to investors, and employ all the labor and buy all the equipment and materials that they need. Railway employees, as well as railway investors and manufacturers and producers of fuel for whom the railways afford a market, have a common interest in helping to restore railway earning capacity, because, in years of both prosperity and depression, they all suffer together the effects of inadequate railway earning capacity. In 1931 the net operating income earned by the railways for investors was about 57 per cent less than in 1929, the wages paid by them about 28 per cent less, and their purchases from manufacturers about 53 per cent less. While labor is proposing legislation to remedy the effects of railway unemployment, these figures show that it has suffered relatively less in the last two years from the effects of the depression upon the railways than either railway investors or those from whom the railways make purchases.

The Railways as a Market

Even in a period of depression, however, the railroads afford a large market. It is often said that in the railway equipment and supply manufacturing industry it is "always a feast or a famine", but the railways have to operate and render service whether business is good or bad, and probably, on the whole, they afford as stable a market as almost any other industry. In the five years ending with 1930 they expended an average annually of $276,300,000 for equipment and of $1,081,000,000 for materials and supplies, making average annual purchases, direct and indirect, from manufacturers of about $1,357,300,000. Corresponding expenditures in 1931 amounted to about $80,000,000 for equipment, and to about $560,000,000 for materials and supplies, making total purchases from manufacturers of about $640,000,000. This was a reduction of about $718,000,000, or 53 per cent, as compared with the average of the preceding five years. The reductions in the quantities purchased were less than these figures indicate because prices were lower than in the preceding five years. An industry that spends $640,000,000 with manufacturers even in a year of the severest depression ever known affords a very large market, and while those who manufacture for the railways suffered greatly last year from the reduction of their business they can hardly be said to have been completely out of business when the aggregate purchases made from them were so large.

As usual in every period of depression, the manufacturers of equipment were the most affected, purchases from them having shown a decline as compared

with those of the preceding five years of about 70 per cent, while other purchases declined less than 50 per cent. Purchases of fuel in the five years ending with 1930 averaged about $393,500,000 annually, while in 1931 they amounted to only about $224,200,000.

Aishton on Future of the Railways

In an article published elsewhere in this issue, R. H. Aishton, chairman of the Association of Railway Executives, says:

"Any one who is pessimistic as to the railroads' future is lacking in confidence in the future of this United States. The railroads are not among these calamity howlers. It is unthinkable that an industry second in importance to nothing in the country, except possibly agriculture, in the final analysis will ever be permitted by the people of this country to retrogress to that condition of inadequate transportation which existed only a few years ago. The railroads further believe that the shipping public, legislators, and regulating authorities will recognize this to a greater degree than ever in view of the situation confronting their means of transportation today."

The experience of the railways during the last decade, and especially during the present depression, might not seem encouraging, and yet that very experience justifies the optimism expressed by Mr. Aishton. Both the national and state governments and the managements of the railways followed certain policies during this period. The national and state governments restricted the earnings of the railways too much and fostered excessive competition with them by subsidizing other means of transportation without regulating them. The railways did not act with sufficient unity and aggressiveness in maintaining their rates and demanding fairer and more constructive regulation. The existing railway situation is the result.

With this experience behind them, and the present railway situation confronting them, more unity and aggressiveness by railway managements in controlling competition between themselves and demanding fair treatment from public authorities, and a public sentiment that will back them in demanding such treatment, may reasonably be expected.

Attitudes of Commission and Employees

One favorable sign is the attitude recently assumed by a majority of the members of the Interstate Commerce Commission. While not conceding in its opinion in the 15 per cent rate case or in its annual report that its regulation of rates is largely responsible for the present railway financial situation, the commission did finally allow the railways to use according to their own plan the revenues that will be derived from the advance in rates authorized by it. It also made highly constructive comments and suggestions regarding the way in which the railways should co-operate in future and regarding the way in which other means of transportation should be treated to establish equality of opportunity between them and the railways. Criticism of the commission's past policy is warranted; but it can be very helpful to the railways in dealing with the problems presented by prevailing unfair and excessive competition in the field of transportation, and it is gratifying and encouraging that it shows a disposition to do so.

Another favorable sign is the attitude of railway employees. The railway labor organizations are adopting a militant policy regarding the subsidization and lack of regulation of competing carriers which has been causing so many railway men to lose their employment. They have great political power, and if they use it to protect railway traffic and employment from unfair competition they will incidentally use it in such a way as to be very helpful to the railways. The recent attitude of railway labor leaders and employees regarding wages also has been unprecedentedly reasonable and fair. Most of them have squarely faced the fact that, under existing conditions, wages must be reduced, at least temporarily. This is an entirely new attitude, and inspires hope of greater co-operation between managements and employees in the future that will be beneficial to both.

Zero-Hour of Railroads Has Passed

Public sentiment toward the railways had been made unprecedentedly favorable during the years of prosperity by the remarkable improvement in service, and has been made even more favorable by the desperate financial plight to which the railways have been reduced by the depression. While many shippers opposed the 15 per cent advance in freight rates, many of them also favored it. Business men generally have recognized more fully and frankly within recent months than ever before that there is something seriously wrong with the transportation situation in the United States, and that it must be righted. Business men are no more anxious to pay higher rates than employees are to receive smaller wages; but it is highly significant that apparently they will join without much protest in temporarily paying higher rates and accepting lower wages, which combined will be equivalent to furnishing the railways with over $300,000,000 more revenues in 1932 than in 1931, and if traffic improves, they will be equivalent to furnishing revenues aggregating even more than this amount.

The net operating income earned by the railways and the average number of persons employed by them in 1931 was the smallest in thirty years. On December 17 the average market price of railway stocks was 35 per cent less than any average ever reported in any previous depression, and 51 per cent less than the lowest average reported in the depression of 1921. Apparently this was the zero hour in railroad financial history. Prices of both railway bonds and stocks have since advanced, and there are numerous good reasons for believing that, while many railways are not out of financial danger, the general railway situation will be far better at the end of 1932 than it was at the end of 1931.

How to Solve the Railroad Problem

By R. H. Aishton

Chairman Executive Committee, Association of Railway Executives

MUCH experience has demonstrated that in attempting to solve a problem it is always wisdom first to consider what the causes were leading up to that particular situation. As the railways see it their problem, largely a financial one, as of today is chargeable to—

1. A severe and long continued business depression.
2. Defects in the regulatory system, which result in the inability of the railroads in normal times to build up reserves sufficient to deal effectively with emergencies and depressions such as now exist. No system can be sound which encourages rate reductions in prosperous times and increases them in times of economic distress.
3. Competition with unregulated forms of transportation.

The Railroads' Solution

It is the railroad belief—

A. That the greatest measure of help will come through an increase in traffic, although this will not solve the problem for the future.

B. That, in the light of the experience of the last eleven years, the conclusion is inevitable that the public interest requires a review of those provisions of the Transportation Act which directly and adversely affect the credit of the carriers.

C. That all agencies furnishing transportation for hire should be appropriately regulated in order that stability and equal opportunity among them may be created and established. This is necessary so there may be a complete and coordinated system of transportation embracing all land and water transportation agencies.

R. H. Aishton

It would then be possible to arrive at definite conclusions as to the proper sphere of each method of transportation. Future efforts would be devoted to providing the most satisfactory means of transportation at the lowest possible cost, all items of cost being included. No solution of the problem as to the part the various forms of transportation may finally play in the ultimate transportation structure of this country can be worked out until all are brought under approximately the same general requirements as to regulation.

No General Prosperity Unless Railways Prosper

It is generally admitted that the railroads, to quote the Interstate Commerce Commission, are "the backbone and most of the other vital bones of the transportation system of the country." The magnitude of the investment in railroad transportation and its supreme importance to the public is, regrettable to say, very often overlooked by those responsible for both legislation and regulation. Back of this apparently lies a failure to realize the indisputable fact that we cannot have general prosperity in this country without prosperous railroads.

Consolidation Imperative—Co-operation Also

As to the things that can be done by the railroads themselves, they not only believe it necessary, but are continuing their energetic efforts in even greater degree, if possible, to bring about a reduction in their costs of operation in every manner, including the opportunities made possible by consolidation and by cooperative effort.

They have made enormous strides in the direction of economical and efficient operation, particularly since 1923, through modernization of their machine and by a change of operating methods, with consequent great reductions in operating and maintenance costs.

There is still room for continued improvement, but to accomplish it means a continuation of expenditures for improved equipment and other facilities that have helped to produce that result. It cannot be expected that there can be any great further inflow of capital to this backbone of the country's commerce unless the return on that capital will justify the continuation of such expenditures.

Future of the Railroads

Any one who is pessimistic as to the railroads' future is lacking in confidence in the future of this United States. The railroads are not among these calamity howlers. It is unthinkable that an industry second in importance to nothing in the country, except possibly agriculture, in the final analysis will ever be permitted by the people of this country to retrogress to that condition of inadequate transportation which existed only a few years ago.

The railroads further believe that the shipping public, legislators and regulating authorities will recognize this to a greater degree than ever, in view of the situation confronting their means of transportation today.

It is their further belief that such a constructive public view is in the making and will result in a stabilization that will permit the country to go forward with greater prosperity than ever. To bring transportation in all forms into effective coordination and under proper public supervision and regulation will contribute materially to such revival.

Supply Field's Prospects for 1932

By Alba B. Johnson

President, Railway Business Association

A MANUFACTURER of locomotives the other day described his reaction to an inquiry. The order would be for one locomotive. "I did not refer this to any other officer of the company," he said, "but spent three days hunting for the prospective buyer. When I had found him I devoted the whole of one afternoon to discussing changes in design." He did not say whether he ultimately received the order. The incident reflects a condition in which all ordinary proportions and dimensions of business volume and value are in the discard. The stout-hearted can still laugh at a joke on themselves and their famine. Men of long memories and strong telescopes can foresee the revival, probably swift when it starts and immense because preparation for it has been prudently tardy. But for the moment as we cross the invisible line into 1932 the industry is still under a strain so protracted that not even the oldest patriarch amongst us can cite a parallel, and waxing cumulatively intense.

Alba B. Johnson

The year now ending is the first in the depression in which our guild has suffered the full force of deprivation without benefit of what President Hoover is now calling a "cushion." Measure purchases in terms of capital plus maintenance minus direct maintenance wages. In 1930 this figure was $141,000,000 off from 1929, or 8.4 per cent. But while in the same year maintenance (including wages) declined from $2,058,000,000 to $1,724,000,000, or 16.2 per cent, reflecting a drop of 15.9 per cent in gross railway operating revenue, capital outlays were affected by the President's conference with railway executives in November, 1929, who agreed to maintain or enlarge their capital programs for 1930. The actual outcome was enlargement. Capital expenditures in 1930 reached $872,608,000, an increase over 1929 of $18,887,000, or 2.2 per cent.

Well before the end of 1930 it was evident to all concerned that keeping up capital programs by joint resolutions of the several groups upon whom that course had been urged at the White House was not going to pry the country out of contraction, and that in any event no industry, least of all the railroads, due to special limitations, could persist with it on any available financial resources short of Aladdin's lamp. Even in the second half of 1930 capital outlay sagged off. So in 1931, with total maintenance $1,372,000,000, or 33.3 per cent under 1929, capital outlays, as nearly as can be estimated from figures already available, will have been perhaps not more than half 1929, or $427,000,000. On that basis purchases in 1931 (capital plus maintenance minus direct maintenance wages) were $988,000,000, a drop from 1929 of $710,000,000, or 42 per cent.

If the forecaster curbs on the one hand his hope of an up-turn in traffic and railway earnings in 1932, and on the other his fear of further recession, he must consider the railways' "absolute" necessities and their tangible resources. You might say that, given the amount they "ought" to spend, they will spend all of it if they can, and, if not, as much of it as is given them.

In view of the heroic capital expenditures of 1930, such outlays were doubtless down to bed rock in 1931 and can hardly be expected to rise above that figure in 1932. With no break in the depression probably they will be about the same. Large projects carried through during a period of years and completed in 1931, may not be replaced, as things are, by the launching of others. This factor will tend to keep the capital total below 1931. On the other hand, an increase in maintenance, if any, will involve a certain amount of expenditure charged to capital as a part of the operation—that is, replacement of rolling stock, a structure or an appliance by a better one.

May we, however, assume an increase in maintenance? It is serious to charge "under-maintenance," and difficult to support the assertion with facts or yardstick. I am willing to say, however, that I do not see how an increase can be deferred without a sag in standards. Roughly, maintenance rises and falls with the curve of traffic volume. A railroad repairs the damage that the traffic has done. Rather from observation and fragmentary evidence than from systematic analysis, I have the impression that a stronger financial position would find the railways in general increasing maintenance at a higher rate than any actual rise in traffic volume.

What can they do this with?

In denying the 15 per cent advance the Commission specified a number of recent rate adjustments previously sanctioned and expected to produce additional revenue estimated by various authorities at from $50,000,000 to $90,000,000—say $70,000,000. The advances substituted for 15 per cent by the Commission are commonly calculated to yield about $120,000,000 a year, or $150,-

(Continued on Page 34)

A Review of Railway Operations in 1931

Dr. Julius H. Parmelee

Record for 1931 even worse than that of 1930 — Several hopeful factors in evidence at end of year

By Dr. Julius H. Parmelee
Director, Bureau of Railway Economics

TREND lines on the chart of railway operations again ran downward in 1931, and to an even greater extent than in 1930, with the result that the year closed in an atmosphere of considerable doubt and anxiety regarding the future. On the other hand, some elements of hope were discernible on the horizon at the year end, and all observers were looking eagerly for an economic sun whose rays might dispel the clouds of gloom and uncertainty that hung over the railways throughout the year.

We may summarize the somber and the hopeful elements in turn. As in 1930, all the traffic and revenue factors in rail operations in 1931 fell below the corresponding levels of the preceding year, and were thus cumulatively lower than in 1929. Traffic moved in lesser volume, revenues were down, expenditures of all kinds were further reduced, and the rate of return dropped perilously close to the vanishing point. Dividends were reduced or omitted by many of the leading railway corporations, several roads went into receivership, and retrenchment was the order of the day in all lines of rail activity.

Looking through these clouds of gloom, we may see some brighter gleams. The railways of the United States in 1931 presented a more solid front against adversity than in any peace-time period in their history. They filed a nation-wide petition for increased freight rates, and on a uniform basis for all districts. When the Interstate Commerce Commission granted them a partial rate increase, on condition that the revenues derived from the increase be pooled, the railways again made common cause and secured from the Commission certain modifications of the original conditions. At the close of the year, they were engaged in organizing the Railroad Credit Corporation for the strengthening of the financial position of the weaker lines, and were successful in assuring support of the railway companies for such a program.

In addition, the railways in 1931 took a number of steps toward a more nearly standardized handling of their labor and wage problems.

Another gain was the growth of a clearer understanding of the railway situation in 1931 by the public than for some time in the past. Part of this was due to the facts developed in the course of the rate case, while part grew out of a gradually increasing public realization that railway credit is a foundation stone in our economic and financial structure. This realization manifested itself in a number of ways. The Interstate Commerce Commission's original and supplemental reports in the rate case clearly typified it. Governmental interest in the financial welfare of the railways was exhibited in several quarters, culminating in the proposal for a Reconstruction Finance Corporation, contained in the President's annual message to Congress. This proposal was under active consideration by Congress at the close of the year.

How all these factors will eventuate cannot yet be foreseen. But with greater solidarity of interests and of policies within the industry, and with increasing public concern over its financial situation, it seems clear that foundations have been laid for a broader approach to its problems in the future.

Outstanding Factors in 1931

The fundamental features of railway operation in 1931 are summarized below:

1. Freight traffic in 1931 declined about 19 per cent below 1930. The cumulative declines of 1930 and 1931 brought the level of freight movement in 1931 down to that of 1921.

2. Passenger traffic fell 19 per cent below 1930. Total passenger-miles in 1931 were less in number than in any previous year since 1904.

3. Total operating revenues in 1931 declined 20 per cent below 1930, the aggregate for the year being lower than in any previous year since 1917.

4. Total operating expenses were lower in 1931 than

in 1930 by 18 per cent, and were less than for any preceding year back to 1917. All of the principal groups of operating expenses were drastically reduced in 1931.

5. The operating ratio averaged 76.9 per cent in 1931, compared with 74.4 per cent in 1930.

6. Net railway operating income aggregated $534,000,000 in 1931, which was a decline of $351,000,000, or 40 per cent, under 1930. The decline from 1929 to 1931 was $741,000,000, or 58 per cent.

7. Rate of return earned on railway property investment was 1.99 per cent in 1931. The corresponding rates for 1930 and 1929 were 3.36 per cent and 4.84 per cent, respectively. The rate for 1931 was lower than in any year since 1920.

8. The index of railway efficiency in 1931 fell slightly below that of 1930, but was at a higher level than in any year from 1920 to 1929, inclusive.

9. Five factors of railway performance made new records during the year 1931.

Freight and passenger traffic continued to decline in 1931. Table I is a traffic summary for the years 1926 to 1931. Freight traffic is stated in terms of both revenue carloadings and net (revenue and non-revenue) ton-miles. The railway freight traffic of each of the years from 1926 to 1929, it will be recalled, was greater in amount than that of any year prior to 1926.

Table I
Comparative Traffic Statistics

Revenue Carloadings	
1931	37,250,000
1930	45,880,000
1929	52,828,000
1928	51,590,000
1927	51,636,000
1926	53,099,000
Net Ton-miles	
1931	340,000,000,000
1930	422,117,000,000
1929	492,313,000,000
1928	477,183,000,000
1927	474,696,000,000
1926	488,702,000,000
Passenger-Miles	
1931	21,800,000,000
1930	26,823,000,000
1929	31,078,000,000
1928	31,616,000,000
1927	33,656,000,000
1926	35,499,000,000

All the statistics in Table I, and in succeeding tables, relate to railways of Class I. In the case of revenue and expenses, large switching and terminal companies are included. As this article was necessarily prepared before the close of the year, the several statistics presented for 1931 are estimated, and will be subject to later revision.

Carloadings

Revenue loadings of freight in 1931 are estimated at 37,250,000 cars, an average of 716,000 per week. This was the smallest traffic reported in any year of the fourteen-year period during which these statistics have been collected.

There were no million-car-or-over weeks in either 1930 or 1931. In fact, no weekly total in 1931 reached as high as 800,000 cars. The peak traffic of the year 1931 was reported for the week ending October 5, when total loadings reached 777,837 cars. The annual peaks for the six years from 1926 to 1931 were reported for the weeks and in the amounts indicated below:

	Maximum Loading (cars)
1926 (Oct. 26)	1,208,878*
1927 (Oct. 19)	1,129,055
1928 (Sept. 29)	1,196,965
1929 (Sept. 28)	1,203,139
1930 (Aug. 30)	984,504
1931 (Oct. 5)	777,837

* All-time record.

Ton-Miles

According to the ton-mile measure of traffic, freight movement in 1931 aggregated 340,000,000,000 ton-miles, a decrease of 19.5 per cent under 1930, and 31 per cent under 1929. Not only was the decline relatively greater in 1931 than in 1930, but it showed no tendency toward improvement during the past year.

Each of the three districts showed heavy declines. Ton-miles fell off by 18.5 per cent in the Eastern District, 18.8 per cent in the Southern Region, and 20.5 per cent in the Western District.

Freight Traffic Trend

The course or trend of freight traffic is sometimes calculated by comparing increases or decreases on the basis of a three-month "moving average." This method compares any year with a five-year average, taking successive periods of three months each, and passing from one period to the next by dropping the first month, and adding a month at the other end. The use of three months as a basis smooths out the curve, and makes the trend more fully discernible.

Table II presents the decrease in carloadings during the years 1930 and 1931, the percentages being the decrease of each successive three-month period under the corresponding period of the five-year average, 1925 to 1929.

The first three-month period ending with January, 1930, showed a decline of 4.4 per cent under the average. There followed a long and gradually growing succession of decreases, which reached 33.8 per cent by the end of the year 1931.

Table II
Decreased Carloadings Measured by Three-Month Periods

Period	Per cent Decrease
Nov.-Jan. (1930)	4.4
Dec.-Feb.	5.2
Jan.-Mar.	6.8
Feb.-Apr.	6.3
Mar.-May	7.4
Apr.-June	8.0
May-July	9.7
June-Aug.	11.9
July-Sept.	14.0
Aug.-Oct.	15.8
Sept.-Nov.	17.3
Oct.-Dec.	18.2
Nov.-Jan. (1931)	20.0
Dec.-Feb.	21.6
Jan.-Mar.	23.3
Feb.-Apr.	23.1
Mar.-May	24.2
Apr.-June	25.1
May-July	26.5
June-Aug.	28.7
July-Sept.	31.1
Aug.-Oct.	32.9
Sept.-Nov.	33.8
Oct.-Dec.	33.8

Little in this table offers immediate encouragement as to an upward turn, or even a checking of the downward trend, in railway freight traffic.

The chart on page 12 is based on the figures of Table II, and has been extended back to 1929 to give an idea of the contrast between that year and the years 1930 and 1931. It covers a period of three years, showing the trend from the beginning of 1929 to the close of 1931. Beginning about the middle of 1929, the curve turned downward, crossed the line of parity with the five-year average in October, 1929, and maintained its decline in practically every subsequent period.

Loadings According to Commodity Groups

Table III distributes the revenue carloadings of 1931 among the eight principal commodity groups, according to the Car Service Division's classification. The aggregates for each group are shown for 1931, while the percentage distribution of the groups is included for both

1931 and 1930, so as to supply a comparison of the two years.

Table III
Distribution of Carloadings, by Groups

	Number	Per Cent	
	1931	1931	1930
Grain and products	2,039,000	5.5	4.9
Live stock	1,157,000	3.1	2.8
Coal	6,542,000	17.6	17.3
Coke	327,000	0.9	1.1
Forest products	1,484,000	4.0	5.2
Ore	874,000	2.3	3.6
Merchandise, L.C.L.	10,950,000	29.4	26.6
Miscellaneous	13,878,000	37.2	38.5
Total	37,250,000	100.0	100.0

All of the eight commodity groups declined heavily in 1931, the percentage of decrease ranging from 10.0 per cent for grain and live stock to 47.4 per cent for ore. Miscellaneous loadings fell off 21.5 per cent, merchandise 10.2 per cent, and coal 17.5 per cent. Grain and grain products, live stock, coal, and merchandise loadings showed increases in their percentage ratio to total carloadings. Stated differently, these four groups declined at a somewhat lesser rate in 1931 than did carloadings as a whole. The same phenomenon occurred in 1930 with respect to the same four commodity groups. The other four groups—coke, forest products, ore, and miscellaneous (or manufactures)—fell off in 1931, as in 1930, at a rate higher than the rate for all commodities.

Not only were the total carloadings the lowest for the past fourteen years, for which records are available, but seven of the eight commodity groups were the lowest recorded for the past ten years, coke being the sole exception.

Financial Results in 1931

Total operating revenues of railways of Class I in 1931 aggregated $4,259,000,000, a decrease of $1,084,000,000, or 20.3 per cent, under the corresponding total for 1930. The decline under 1929 was $2,101,000,000, or 33.0 per cent.

Total operating expenses amounted to $3,275,000,000, which was a reduction of $701,000,000, or 17.6 per cent, under 1930. The reduction below 1929 was $1,286,000,000, or 28.2 per cent.

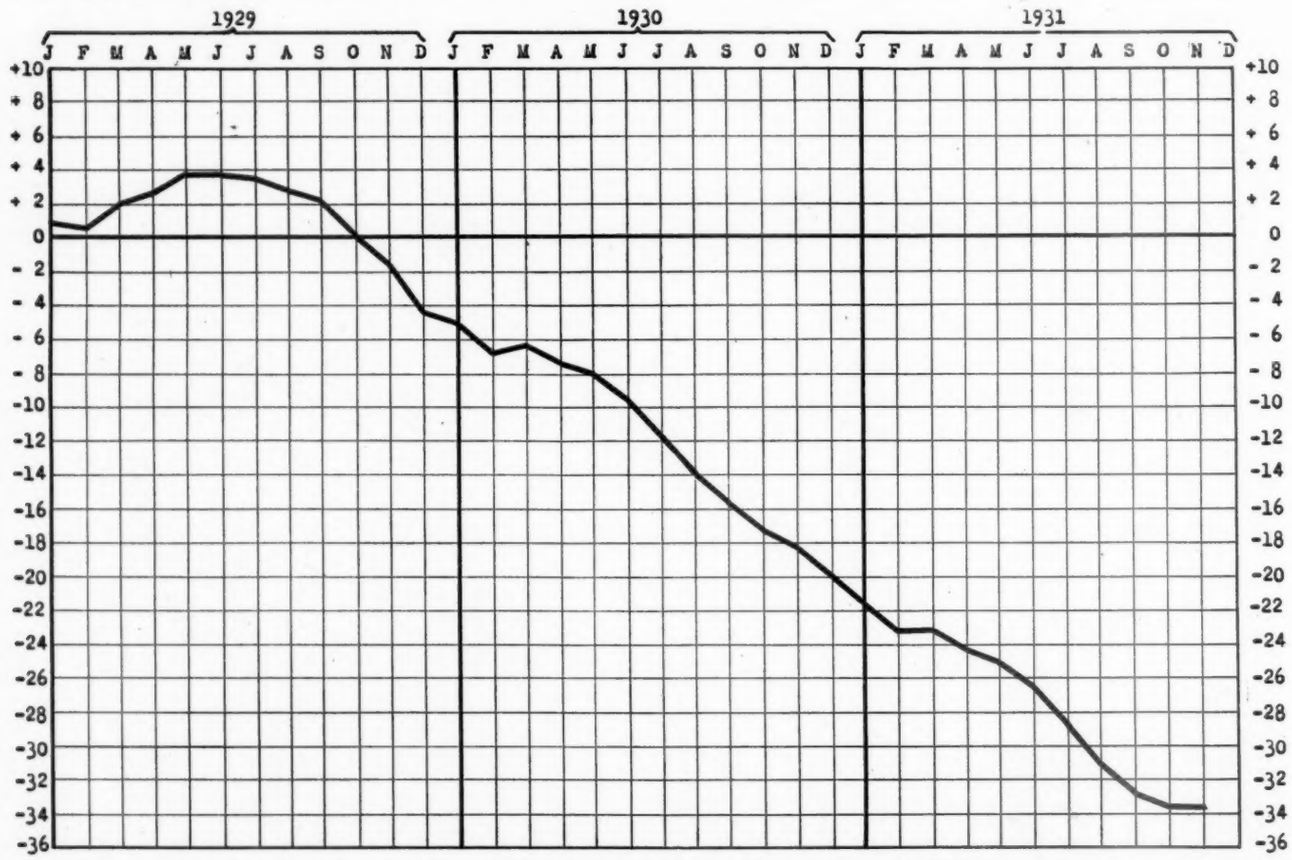
The operating ratio in 1931 stood at 76.9 per cent, compared with 74.4 per cent in 1930, and 71.7 per cent in 1929.

Railway taxes in 1931 amounted to $315,000,000. This was a decrease of $39,000,000, or 11.0 per cent, under 1930, and reflects the reduced gross and net income of the year 1931. The same thing occurred in 1930, a decline in total railway taxes being due solely to a decline in the income on which many Federal and State corporation taxes are calculated. Property taxes have shown no indication of any decline as yet.

The ratio of rail taxes to operating revenues, moreover, rose to a higher level in 1931 than in any previous year. The ratio was 7.4 per cent in 1931, compared with 6.6 per cent in 1930, and 6.3 per cent in 1929.

To say that the tax ratio was 7.4 per cent is to say that 7.4 cents of every dollar of railway revenues in 1931 was absorbed by Federal, state, and local tax requirements. This measures the incidence of taxes more accurately than do the figures of gross amounts paid out in taxes, and emphasizes the fact that the railway tax burden in 1931 was relatively heavier than ever before.

This burden—cents of taxes per dollar of revenue—has been growing rapidly. The trend from 1921 to 1931 is indicated in the table at the top of the next page, and shows a rise from 5.0 cents per dollar of revenue in 1921 to 7.4 cents in 1931, or 48 per cent.



Decreased Carloadings, 1929-31—Per Cent of Increase or Decrease over Corresponding Period of Five-Year Average, 1925-1929, Based on Middle Month of Successive Three-Month Periods, Class I Railroads

	Railway taxes Cents per Dollar of Revenue
1931	7.4
1930	6.6
1929	6.3
1928	6.4
1927	6.1
1926	6.1
1925	5.9
1924	5.8
1923	5.3
1922	5.4
1921	5.0

The tax increase from 1930 to 1931 alone was 8 mills per dollar of revenue. This increase, when applied to the total revenues of the year 1931, represents a relative increase in the tax burden of more than $34,000,000. While the tax ratio will doubtless decline somewhat as revenues return more nearly to normal, the problem is and continues to be a serious one.

Net railway operating income is what is left of operating revenues, after payment of operating expenses, taxes, and certain equipment and other rental items. The net for 1930 dropped below $900,000,000 for the first time since 1922. The net for 1931 declined still further to $534,000,000, a decrease of 39.7 per cent under 1930, and 58.1 per cent, or nearly three-fifths, under 1929. This amount would not be sufficient, without the assistance of non-operating income, to meet the interest and other fixed charges of the railways, let alone dividend payments, surplus for capital improvements, and the like.

Table IV is a condensed income account of the railways of Class I for the year 1931, compared respectively with 1930 and 1929.

Table IV
Condensed Railway Income Account

	1931 (millions)	1930 (millions)	1929 (millions)
Total operating revenues	$4,259	$5,343	$6,360
Total operating expenses	3,275	3,976	4,561
Taxes	315	354	403
Net railway operating income	534	885	1,275
Operating ratio	76.9%	74.4%	71.7%

While every total in this table shows a continuous decline from 1929 to 1931, it will be noted that the greatest relative declines took place in net railway operating income. Operating ratio, which is not a total but a percentage, increased; in this case an increase is a retrogression.

Table V is a comparative statement of rate of return on railway property investment, for each year from 1921 to 1931. Because statistics are as yet incomplete regarding the amount of railway investment at the end of 1931, the rate of return is computed for that year (also for 1930, for comparison) on the basis of the investment at the beginning of the year, whereas for the other years in the table the rate is computed on the end-of-the-year investment, which is the method followed by the Interstate Commerce Commission. As investment usually increases during any one year, the base also increases. Any rate of return calculated on the property investment as of the beginning of the year would therefore be slightly greater than when calculated on the investment as of the end of the year.

Table V
Rate of Return on Property Investment
(Including material, supplies, and cash)

Computed on investment at *beginning* of year:	
1931	1.99%
1930	3.36
Computed on investment at *end* of year:	
1930	3.30%
1929	4.84
1928	4.64
1927	4.29
1926	4.98
1925	4.74
1924	4.21
1923	4.33
1922	3.58
1921	2.84

The rate of return for 1931 computed as just described was 1.99 per cent, more than 40 per cent below the low rate of 3.36 per cent attained in 1930, and considerably less than half as great as in 1929. Corresponding rates of return for the respective districts in 1931 follow: Eastern District, 2.24 per cent; Southern Region, 1.32 per cent; Western District, 1.92 per cent.

In brief, the rate of return for the year 1931, 1.99 per cent, was lower than in any of the ten years from 1921 to 1930, inclusive. It was considerably lower than the 2.84 per cent reported for 1921, which was also a year of economic depression.

Railway Operating Revenues

Table VI summarizes the principal items of railway operating revenue in 1931, compared respectively with 1930 and 1929.

Table VI
Railway Operating Revenues

	1931 (millions)	1930 (millions)	1929 (millions)
Freight revenue	$3,275	$4,086	$4,832
Passenger revenue	555	730	874
Mail revenue	105	111	152
Express revenue	83	115	148
All other	241	301	354
Total	$4,259	$5,343	$6,360

Total operating revenues showed a declining trend from 1929 to 1931. Every revenue group in 1931 showed a similar trend, falling below both 1930 and 1929.

Comparing 1931 with 1930, freight revenue declined $811,000,000, or 19.8 per cent. As this was in addition to a decline of $746,000,000 in 1930, the cumulative decrease in freight revenue from 1929 to 1931 was $1,557,000,000, or 32.2 per cent.

Passenger revenue declined by $175,000,000 in 1931, or 24.0 per cent. Mail revenue showed the smallest decrease of any revenue group, the decline being $6,000,000, or 5.4 per cent. The amount of back mail pay received by the railways from the government in 1929 and charged to the mail revenue of that year was approximately $38,000,000. Any comparison of mail revenue in 1931 and 1929 should therefore be adjusted accordingly. Express revenue decreased 27.8 per cent in 1931, while "all other" revenue declined 19.9 per cent.

Railway Operating Expenses

Table VII summarizes the principal groups of the operating expenses in 1931, compared respectively with 1930 and 1929.

Table VII
Operating Expenses

	1931 (millions)	1930 (millions)	1929 (millions)
Maintenance of way	$553	$713	$865
Maintenance of equipment	828	1,027	1,212
Traffic	117	128	131
Transportation	1,562	1,875	2,113
General and other	215	233	240
Total	$3,275	$3,976	$4,561

Each of the principal or general expense accounts showed reductions in 1931 compared with 1930, and still larger declines when compared with 1929. This is in line with the trend for operating expenses as a whole.

The railways reduced their maintenance of way expenses in 1931 to the amount of $160,000,000, or 22.4 per cent. The decline from 1929 to 1931 was $312,000,000, or 36.1 per cent.

Maintenance of equipment expenses in 1931 were reduced by $199,000,000, or 19.4 per cent. The decline

from 1929 to 1931 aggregated $384,000,000, or 31.7 per cent.

The largest expense group, transportation expenses, was reduced by $313,000,000, or 16.7 per cent, from 1930 to 1931. Compared with 1929, the decline in 1931 amounted to $551,000,000, or 26.1 per cent.

The railways made a valiant effort in both 1930 and 1931 to bring their operating expenses down at the same rate of decline as was shown by the revenues. The obstacles to the complete success of such a policy were the large proportion of more or less fixed expenses that cannot be reduced to correspond to traffic declines, and the obligation of the carriers to maintain their properties in effective and safe condition, regardless of traffic levels.

Revenue Per Traffic Unit

Table VIII shows what revenue was received by railways of Class I for the average ton-mile of freight, and the average passenger-mile, for each year from 1921 to 1931. This is the complete period of years since the general rate increase authorized by the Interstate Commerce Commission in 1920 became effective.

Table VIII
Average Revenue Per Ton-Mile and Passenger Mile, 1921-1931

Year	Revenue per ton-mile (cents)	Revenue per passenger-mile (cents)
1931	1.055	2.520
1930	1.063	2.717
1929	1.076	2.808
1928	1.081	2.850
1927	1.080	2.896
1926	1.081	2.936
1925	1.097	2.938
1924	1.116	2.978
1923	1.116	3.018
1922	1.177	3.027
1921	1.275	3.086

Freight revenue per ton-mile has declined almost steadily, from 1.275 cents in 1921 to 1.055 cents in 1931. The decline for the whole period of ten years was 17.3 per cent, and from 1930 to 1931 was 0.8 per cent. Average revenue per ton-mile depends on a number of factors, such as character of traffic, length of haul, and readjustments in basic freight rates. Rate readjustments are an important factor, as is apparent from the fact that the Commission's rate decision of 1922, readjusting all freight rates downward by 10 per cent, accounts for more than half the total decline of 17.3 per cent between 1921 and 1931.

Passenger revenue per passenger-mile has also declined, dropping from 3.086 cents in 1921 to 2.520 cents in 1931. The relative decline was 18.3 per cent for the ten years from 1921 to 1931, and 7.3 per cent during the one year between 1930 and 1931. These declines have been due largely to the relative stability of commutation passenger traffic, in the face of declining longer-haul travel, and to special rates offered by the carriers to stimulate passenger traffic.

Both the average revenue per ton-mile and passenger mile were lower in 1931 than in any of the preceding years of the inclusive eleven-year period covered by the table.

Gross Capital Expenditures

Table IX summarizes the gross capital expenditures of railways of Class I, for each year from 1923 to 1931. The railways' program for increased efficiency of operation, and for improvement of their plant, became effective in 1923, and capital expenditures in that year were greater than for any year in railway history, or at least since railway building on a large scale slowed down.

Gross capital expenditures for 1931, without allowance for retirements or abandonments, approximated $400,000,000, although statistics for only the first six months of the year were in hand as this article was written. This total was smaller than in any of the nine years included in the table.

Table IX
Gross Capital Expenditures

1931	$400,000,000
1930	872,608,000
1929	853,721,000
1928	676,665,000
1927	771,552,000
1926	885,086,000
1925	748,191,000
1924	874,744,000
1923	1,059,149,000
Total nine years	$7,141,716,000

In contrasting 1931 with 1930, it should be kept in mind that the railways in 1930 maintained their capital improvements at something higher than normal levels, only because the suggestion of such a policy came to them from high government officials. They were subjected to considerable later criticism for adopting the policy, which of course could not be continued into 1931.

Equipment Installations

Monthly reports with respect to new units of equipment placed in service are summarized in Table X, down to the end of November for locomotives and freight cars, and to the end of September for passenger cars. The number of each class on order at the close of the respective period is also stated. These statistics exclude any units that may be leased by railway companies to other railway companies. The table compares 1931 with corresponding periods of 1930 and 1929.

Table X
New Equipment Installations

	Installed Jan. 1-Nov. 30	On Order Nov. 30
Locomotives:		
1931	123	10
1930	744	92
1929	716	299
Freight cars:		
1931	12,302	4,252
1930	75,936	3,884
1929	76,773	30,569
Passenger cars*:		
1931	450	16
1930	1,389	465
1929	2,020	681

* Nine months to September 30.

Locomotive installations for 1931 were only one-sixth as great as in 1929 and 1930, and the number on order at November 30 was only 10 units. Freight car installations were also about one-sixth as great as in 1929 and 1930, but the number on order at the end of November showed a slight increase over the corresponding total for 1930.

Passenger car installations for nine months were about one-third those of 1930, and less than one-fourth as great as in 1929. The number on order at September 30 aggregated 16 units only.

Railway Employees

The number of railway employees showed a further decline in 1931, although the decrease was relatively smaller than the declines in traffic, in revenues, and in operating expenses.

The average number of men and women on railway payrolls during the year approximated 1,285,000, compared with 1,511,000 in 1930, a decrease of 15 per cent. Aggregate compensation to employees fell from $2,590,000,000 in 1930 to about $2.150,000,000 in 1931, or 17.0 per cent.

Average annual earnings per employee are estimated at $1,673 for 1931, compared with $1,715 in 1930 and

$1,744 in 1929. Average compensation per employee per hour showed an increase in 1931 over 1930, and a slightly greater increase over 1929. The averages for nine months were 68.8 cents per hour in 1931, 67.6 cents per hour in 1930, and 66.4 cents per hour in 1929.

Railway Operating Efficiency

The index of operating efficiency declined slightly in 1931, due in part to the fact that with a lower level of traffic the railways were unable to maintain previous averages as to carloads and train loads. Furthermore, the necessity for stark economy forced them to permit an increase in the number of equipment units in bad order.

Despite these facts, some progress in efficiency was made. It is significant that the best showing involved those factors with respect to which railways have complete or essential control. These factors are freight train speed, locomotive fuel consumption, and ton-miles per freight-train hour, where new records were set up in 1931. Five new records were established in 1931 with respect to these factors of operation, there being one record in respect to train speed, two records in respect to fuel consumption (freight and passenger) and two records with respect to ton-miles per ton-hour (gross and net). The same five factors broke all previous records in 1930 as well. The details appear below.

Operating Records in 1931
(Based on ten months)

	1931	1930
1. Freight train speed (M.P.H.)	14.7	13.7
2. Gross ton-miles per train-hour	26,874	25,864
3. Net ton-miles per train-hour	10,909	10,884
4. Fuel consumption per freight unit (Lb. per 1,000 G.T.M.)	118	120
5. Fuel consumption per passenger unit (Lb. per P.T.C.M.)	14.4	14.5

Our general index of operating efficiency has heretofore been computed on the basis of thirteen selected factors of performance. This index is here continued, but on a slightly revised basis. It now contains eleven factors of operation. These are combined in nine separate indices, as follows, two factors each being included in Items 2 and 8.

1. Gross ton-miles per freight train-hour (Excl. L. & T.)
2. Percentage serviceable freight and passenger locomotives.
3. Percentage serviceable freight cars.
4. Freight train speed.
5. Gross ton-miles (Excld. L. & T.) per ton of fuel.
6. Passenger train car-miles per ton of fuel.
7. Freight car-miles per active car day.
8. Locomotive-miles per active locomotive-day (Freight and passenger).
9. Net tons per freight train.

The following Table XI is a composite index of railway operating efficiency, calculated on the basis of factors just named, for the years 1922 to 1931. Each of the nine factors is given equal weight in the index. The table commences with 1922, because that year immediately preceded the adoption of the railways' program of increased efficiency and economy in the spring of 1923. This index utilizes the annual average for the five years from 1920 to 1924, inclusive, as the base period, or 100 per cent.

Table XI
Index of Rail Efficiency
(1920-1924 = 100)

1931	122.8
1930	123.4
1929	122.3
1928	120.2
1927	116.7
1926	113.8
1925	110.5
1924	105.9
1923	101.6
1922	97.6

The efficiency index rose steadily from 1922 to 1930, then showed a slight decline in 1931. This drop, as already indicated, is explained by the necessity for rigid economy and by the depressed traffic situation.

Reserve Equipment

The great reduction in traffic in 1931, as in 1930, affected the amount of equipment held out of service, or in reserve, and led to an unprecedented increase in those reserves. They are measured by the number of stored locomotives and by the number of surplus or idle freight cars, both of which reached peak levels throughout the greater portion of the year 1931.

The daily freight car surplus averaged 594,962 serviceable cars in 1931 (eleven months), compared with annual averages of 456,378 for the year 1930, and 231,804 for 1929.

Stored serviceable locomotives averaged 9,674 in 1931 (eleven months), as against 7,407 for the year 1930, and 5,302 for 1929.

This increase in reserve equipment amounted to more than 2,200 stored locomotives and 139,000 surplus freight cars, compared with 1930.

On the other hand, car shortage disappeared in both of the years 1930 and 1931. This bane of the shipper in earlier years, who suffered great losses when he could not get freight cars promptly to move his raw materials or his manufactured products, has passed out of the railway picture, it is to be hoped for ever.

Physical Condition of Equipment

The proportion of locomotives (freight and passenger) and freight cars in serviceable condition in 1931 declined. Locomotives in good order averaged 83.7 per cent in 1929, 82.5 per cent in 1930, and 79.7 per cent during the first ten months of 1931. Freight cars in good order averaged 94.0 per cent in 1929, 93.8 per cent in 1930, and 92.4 per cent during the first ten months of 1931.

These declines were made necessary by reduced revenues, and the resultant necessity of reductions in maintenance. Inasmuch as the reserve equipment in 1931 was greater than ever before, it is clear that considerable maintenance of equipment could be deferred, by setting the unserviceable units aside and utilizing only those in serviceable condition. This deferred maintenance must of course be brought up to date at some future time.

Freight Train Speed

The average speed of freight trains between terminals increased almost constantly since 1922, and attained a new record in 1931, as indicated in Table XII.

While the considerable improvement in 1931 was probably due in part to the lighter train loads, to which reference will shortly be made, a part also resulted from improved methods of operation, reduction in delays while on the road, and greater power applied to the trains in motion, thus producing higher average speeds.

Freight Car Movement

Mileage per freight car per day, when computed on the basis of all cars in the totals, whether they be out of order, idle, or whether they are being loaded or unloaded by shippers in their free time, or what not, is bound to decline when the number of surplus or idle

cars is large. The average daily movement of the average freight car in 1931, computed according to the standard statistics of the Interstate Commerce Commission (which do include surplus cars) fell below that of both 1929 and 1930. The average was 25.1 miles per car per day during the first ten months of 1931, 28.7 miles per car per day in 1930, and 32.3 miles in 1929.

Table XII
Average Speed of Freight Trains

	Train speed (Miles per hour)
1931 (10 months)	14.7
1930	13.8
1929	13.2
1928	12.9
1927	12.3
1926	11.9
1925	11.8
1924	11.5
1923	10.9
1922	11.1

Such a comparison of freight car movement as this does not measure actual operating efficiency in 1930 or 1931, because freight car surpluses rose to record levels in both years. Clearly, surplus freight cars are not making mileage. The elimination of idle or surplus cars from the average more nearly measures the performance of freight cars in actual or active service. Reduced to such a basis, the comparative performance in 1930 and 1931 shows much better results. The average movement per "active" (i. e., not idle or surplus) freight car per day during ten months of 1931, computed on the basis just indicated, was 33.9 miles, compared with 35.7 miles for the year 1930, and 36.1 miles for 1929. While there was a reduction in 1931, compared with 1929 and 1930, it was much smaller than the standard method would indicate.

As freight train speed was higher in 1931 than in any previous year, and as a freight car travels at the same rate of speed as the train of which it is a part, freight cars while actually in motion were making excellent mileage. Average freight train speed in 1931 was 14.7 miles per hour, or 352.8 miles per day. Any freight car in movement for a continuous period of 24 hours also averaged 352.8 miles.

Locomotive Movement

Mileage per locomotive per day in 1931, like average freight car movement, showed large declines when computed on a basis including stored or idle locomotives. The number of locomotives in storage during the year 1931, as stated, was greater than in any previous year. Like the idle freight car, a stored locomotive makes no mileage, and when counted in the total number on which the average mileage of the average locomotive is computed, that average is bound to go down.

On the "standard" basis of computation, daily movement of freight locomotives averaged 50.9 miles during the first ten months of 1931, compared with 58.0 miles for the year 1930, and 65.1 miles for 1929. The corresponding averages of passenger locomotive movement during the same periods averaged 106.5 miles per day in 1931 (ten months), 116.1 miles during the year 1930, and 120.3 miles in 1929.

Reduced to an "active" basis, however, and excluding stored locomotives from the computation, the average movement for freight locomotives becomes 65.6 miles per day during the ten months of 1931, compared with 70.5 miles for the year 1930, and 74.1 miles per day for 1929. The average movement for "active" passenger locomotives becomes 125.6 miles per day during the first ten months of 1931, 133.3 miles for the year 1930, and 134.8 miles per day in 1929.

Here again, while there were reductions in average locomotive movement per day in 1931, the amount of such reductions is much smaller in the case of "active" units than when all locomotives are counted.

Average Train and Car Load

Average freight train loading declined in 1931, compared with 1930 and 1929. The average was 742 tons during the first ten months of 1931, compared with 785 tons for the year 1930, and 804 tons for 1929.

Average tons per loaded freight car also fell below the averages for 1929 and 1930. The loading for ten months of the year 1931 was 25.8 tons, compared with 26.7 tons per car for the year 1930, and 26.9 tons per car for 1929.

Earlier annual reviews have pointed out that the amount of the load in the freight car is governed to an appreciable extent by shipper desires or practices, and to that degree is not an exact measure of railway performance. Train loads are more fully under railway control, qualified only by the character of the traffic, its volume, and the average carload.

Net Ton-Miles per Car-Day

Net ton-miles per freight car per day in 1931 declined below the years 1930 and 1929. The daily average was 394 miles for the first ten months of 1931, compared with 469 ton-miles per freight car per day for the year 1930, and 547 ton-miles for 1929.

The greatly reduced demand for freight service in 1931 and the great increase in number of surplus cars unquestionably affected the daily performance of the average freight car, and led to decreases.

Gross and Net Ton-Miles per Freight Train-Hour

The increased speed of freight trains in 1931 resulted in higher levels of performance as to both gross ton-miles per train-hour (excluding weight of locomotive and tender) and net ton-miles per train-hour.

The average of gross ton-miles per train-hour in 1931 ran well above that of 1929 and 1930, as follows:

1931 (ten months)	26,874
1930	25,843
1929	24,539

The average number of net ton-miles per train-hour excludes the weight of the cars, and includes only the freight in the train. This factor also broke all records in 1931, as in 1930, and is stated in comparative terms as follows:

1931 (ten months)	10,909
1930	10,839
1929	10,580

Fuel Conservation

Two of the new performance records established by the railways during 1931, as in 1930 and earlier years, related to locomotive fuel consumption. New records were attained with respect to economy of utilization, both in freight and passenger service.

Fuel consumption per 1,000 gross ton-miles in the freight service during the first ten months of 1931 was reduced to 118 pounds, compared to 121 pounds per 1,000 G.T.M. for the year 1930 and 125 pounds for 1929. Any reduction in this factor is, of course, an improvement.

Consistent progress in this important measure of

operating efficiency has been recorded since 1922, as set out in the following table:

	Locomotive Fuel per 1,000 G.T.M. (Inc. Loco. and Tender)
1931 (ten months)	118
1930	121
1929	125
1928	127
1927	131
1926	137
1925	140
1924	149
1923	161
1922	163

The improvement from 1922 to 1931 was a reduction in unit consumption of 27.6 per cent, and 2.5 per cent from 1930 to 1931.

Fuel consumption per passenger train car-mile in the passenger service was lowered to 14.4 pounds during the first ten months of 1931, compared with 14.7 pounds per P. T. C. M. for the year 1930 and 14.9 pounds in 1929. The corresponding average for 1922 was 17.9 pounds per P. C. T. M. The relative improvement was 19.6 per cent from 1922 to 1931, and 2.0 per cent from 1930 to 1931.

The Fifteen Per Cent Case

Next to the traffic and revenue situation, the one outstanding feature of railway operations in 1931 was the Fifteen Per Cent Case and the collateral results that flowed from it.

Early in the year, the railway executives saw clearly that revenues must be increased, or their expenses further reduced, if the industry's solvency were to be maintained. Every possible reduction in operating expenses had been made, short of a general cut in railway wage rates, and the executives were reluctant to propose wage reductions except as an absolutely final resort. The only possible alternative was to petition the Interstate Commerce Commission for authority to increase freight rates.

Once this decision was reached, speedy and unanimous action followed. For the first time in railway history in the United States, railways joined in a nation-wide petition to the Commission, and asked for a uniform increase of 15 per cent in all freight rates and charges.

This petition was presented to the Commission in June. Despite the approach of the heated term, the Commission set the first hearing date for July 15, and the hearings continued with some suspensions until the first week of September. As indicative of the railway's desire to shorten the proceedings, less than a dozen witnesses were presented by them and the financial interests (chiefly savings banks and insurance companies) that intervened in the case on behalf of the carriers. Witnesses for shipper and commercial interests, chiefly opposed to the proposed increases, numbered nearly 650; the testimony totaled 11,719 pages, accompanied by 1,048 exhibits. These figures give some idea of the magnitude of the case, and the character of *pro and con* presentations.

After short time-allowances for preparation of briefs and presentation of oral arguments, the Commission handed down its report on October 16, denying the 15 per cent petition.

At the same time, the report reviewed the railway financial and traffic situation in a sympathetic manner, and suggested some avenues of improvement for the future.

The feature of the report came at the end, where the Commission proposed its now famous pooling plan. If the carriers would pool the increased revenues for the benefit of the weaker lines, the Commission suggested certain specific increases (so much per car, or per hundred weight, according to commodity) on certain specified commodities, agricultural products being largely excepted, and stated that tariffs embodying such increases would be accepted without suspension. These increases would be effective only to March 31, 1933, and were estimated to produce from $100,000,000 to $125,000,000 of added freight revenue per year. This would mean from three to four per cent on the average, instead of the 15 per cent asked for.

As the Commission in its report specifically called upon the carriers to formulate and submit a plan for the marshalling and distribution of the proposed increases in revenue, the railways did so in November. In this plan, certain modifications of detailed provisions of the increases were suggested, and it was further proposed that the increases themselves should be marshalled in a common fund and distributed to carriers needing assistance in meeting their interest payments. This distribution was proposed in the form of short-term loans, to bear reasonably low rates of interest, and to be repayable on specified dates. To carry out the plan the carriers proposed to organize a Railroad Credit Corporation, of limited powers, whose affairs should be administered by the railways for the purposes indicated by the Commission in its report of October 16.

This plan was permitted by the Commission, by a close majority vote, in early December, whereupon the railways organized the Railroad Credit Corporation, and by the end of December had the virtually unanimous assent and support of the railways of Class I. Tariffs were filed, and it was hoped that the new rates and the new Corporation would both commence to function actively by the first of January, 1932.

The Fifteen Per Cent Rate Case of 1931 thus had three important intangible results, in addition to the one big tangible one. These were the crystallization of a spirit of solidarity in the industry itself; the development of an attitude of sympathy and assistance on the part of the Interstate Commerce Commission; the development of a clearer understanding by the general public of the railway problem, its financial aspects, and its relation to the future welfare of the whole nation. The tangible benefit will be found in the added revenue, concentrated in a general fund where it can be utilized for the temporary purpose of assisting in prompt interest payments by the railways.

Railway Securities in 1931

The Fifteen Per Cent Case brought sharply to public attention the vital connection between railway securities and the integrity of the financial structure of the United States. Testimony submitted during the hearings showed, for example, that more than half of the outstanding rail bonds are in the hands of savings banks and insurance companies as investments; further, that whereas three-fourths of all rail bonds were eligible for investment in 1930 by the savings banks of New York State, under the laws of that state, not more than one-third of that three-fourths, or one-fourth the total would continue eligible after January 1, 1932. This is due to the provision that railways must earn their fixed charges at least one and one-half times per year, in order to maintain their bonds as eligible investments for the purposes indicated. Other states have differing provisions and requirements, but it is clear that the bulk of railway bonds will become ineligible or unattractive for fiduciary investment in 1932, unless temporary moratoria are provided by special legislation.

The market effect of this situation, as regards railway bonds, may easily be imagined. During the year 1931, the average price of ten high-grade rail bonds declined from about 94 to 82½, while the ten second-grade bonds dropped from 94 to 63½. This downward movement was aptly described by a banker witness in the case as the "flight of the dollar." One result has been the proposal to include railways among the beneficiaries of the proposed Reconstruction Finance Corporation, to which reference will be made in a later paragraph.

Railway stocks also suffered in 1931, and showed greater relative declines in market value than industrial stocks, great as the decline was in the case of both classes. This decline reflected the great reduction in railway dividends, which to the end of 1931 had reached a grand total of about a quarter billion dollars, when extended to an annual basis. Those critics who contended that the railway companies had paid too much money in dividends in 1930 will find little to criticize in the dividend returns for 1931, and probably, 1932 as well.

Five railways of Class I went into the hands of receivers during the year 1931. This was in addition to one large company that suffered a receivership in December, 1930.

Competition

Transport competition received much attention in 1931, particularly during the hearings in the Fifteen Per Cent Rate Case. Many witnesses threatened to transfer their traffic from rail to waterway or to highways, if the proposed 15 per cent increase became effective.

In addition, the general subject of coordination of, and competition among, the several agencies of transportation was under discussion by government authorities, economists, and business men. It was recognized that the problem has many facets, and that no easy or quick solution is possible. But the fact that the several elements are being considered, and that a general appreciation of the essential importance of the whole question is coming to realization, is in itself a hopeful sign.

Two definite developments of the year were a growing opposition to the government's remaining in competition with private water carriers and with the railways, in its Mississippi-Warrior River Barge Line, and inceasing restrictions on motor vehicles in a number of states. Some states laid definite restrictions on weight, height, length, and other dimensions of vehicles operating over the highways. Others provided heavier rates of taxation on motor vehicles, while still others increased their measures of regulation of commercial motor vehicles.

It was also recognized that the greatest need is for a comprehensive and nonpartisan study of the whole question of competition and coordination in this field of transportation, where as in other industries there is greater capacity to serve than any existing demand for the service. Further, it was becoming clearer that Federal regulation must be set up in the field of interstate commerce by motor vehicle, where only chaos and confusion reign today.

The Interstate Commerce Commission held hearings on the question of motor transport coordination in the autumn of 1930 and the spring of 1931, but issued no findings in the matter during the year 1931. The Commission's report in the Fifteen Per Cent Case referred to this study, as well as to the broad problem of proper regulation of all forms of transportation, in the following language:

> Congress and the State legislatures should also, we believe, direct their attention to the proper regulation in the public interest of all competitive forms of transportation. In this we include such restrictions on the size and weight of trucks and their lading as public safety may dictate, such taxation of trucks and busses as may be necessary to impose upon them a fair share of the burden of the public highways which they use, such supervision of truck and bus common carrier lines as may be necessary to avoid destructive and wasteful competition, and such regulation of their rates and service as the public interest may require. We are here stating only very broad principles, the practical application of which must be governed by the definite ascertainment of facts many of which are now in controversy. Our purpose for the moment is only to direct attention to matters which are in urgent need of legislative consideration. The facts in regard to motor competition we helped to develop some years ago in a report made after special investigation. We hope in the near future to supplement these facts and bring them up to date together with specific recommendations for legislation, in a report on the coordination of rail and motor service which is now in progress.

And in its Forty-Fifth Annual Report to Congress, dated December 1, 1931, the Interstate Commerce Commission made the following specific recommendations:

> That Congress provide for an impartial and authoritative investigation for the purpose of determining whether and to what extent motor, water, and air carriers operating in competition with the railroads are receiving direct or indirect Government aid amounting, in effect, to a subsidy; and if so, what steps, if any, are necessary to correct this situation, with a view to placing competition on a just and equitable basis.
>
> That such investigation, if it is instituted, might well be extended to cover also the question of whether it is desirable in the public interest that regulations affecting public safety and convenience in the operation of motor carriers be made uniform throughout the country, and, if so, how such uniformity may best be brought about.

Summary

We have seen that a survey of railway operations in 1931 does not present a cheerful picture. In our review for 1930 we said, referring to the then possibilities for 1931:

> It will be a matter of keen interest to follow the traffic trend in 1931, and to learn whether history is destined to repeat itself, or whether the current year will be "just another year" to bring renewed anxiety to railway managements and employees.

The year defied history and was worse than "just another year," yet the industry has fared through, and is still looking hopefully forward.

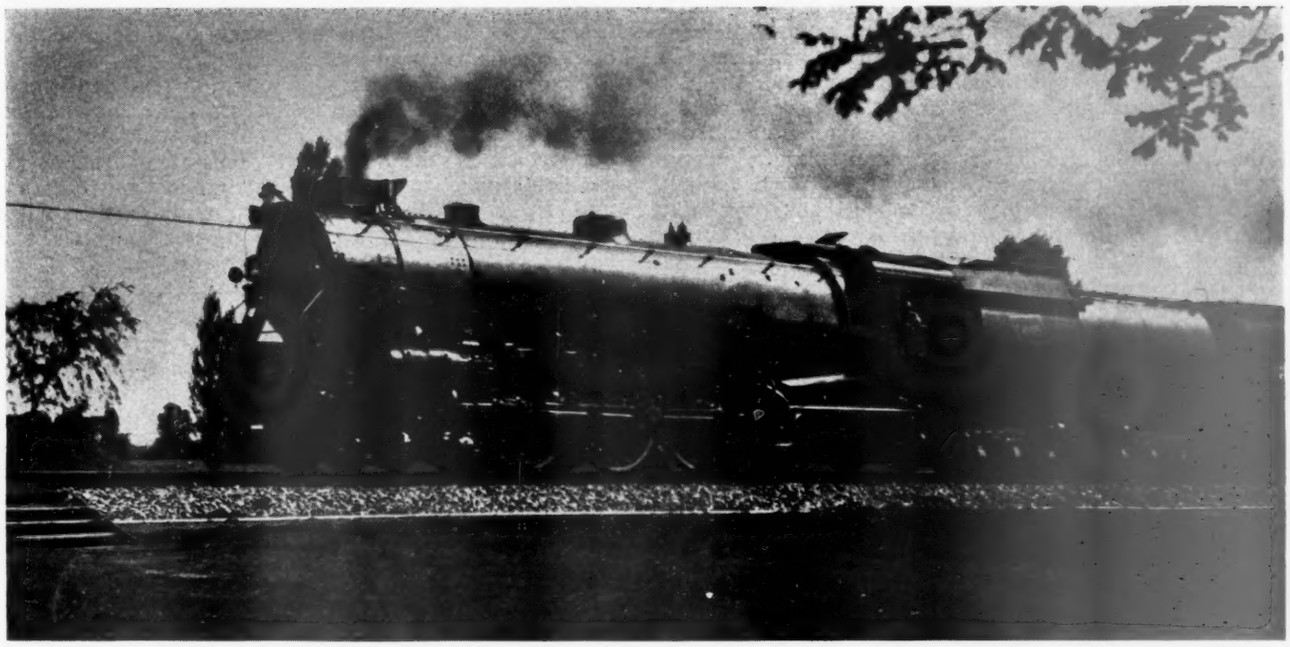
For one thing traffic may pick up, and the upturn that has so long been around the corner may actually arrive. Such a trend in 1932 would do more to bring conditions toward normal than all the temporary palliatives combined.

There is, too, the Railroad Credit Corporation, born of adversity but ready to function throughout the coming year, and to smooth over the rough spots in the pathway of railway interest payments.

At the close of 1931, Congress had under consideration and it was hoped would shortly enact a bill creating the Reconstruction Finance Corporation recommended by the President in his annual message of December 8. This government organization, designed along lines similar to that of the War Finance Corporation, would be financed primarily by the government, supplemented by the issue of its own debentures, and would be authorized to make temporary loans to, or aid in the financing of financial institutions of certain types and the railways.

Again, there is a prospect of relief to the railways in the matter of wage rates and schedules.

Separately or in combination, these several aids to rail recovery will unquestionably be of benefit. But be it repeated, in conclusion, that the return of normal times, with a heartening effect on rail traffic and revenues, is the real New Year gift for which the carriers are looking with an eagerness born of two years of hope deferred.



One of the Canadian National's Newest Passenger Locomotives

Canada Weighs Railways' Future

Public interest in transport problems thoroughly aroused and Royal Commission is seeking causes and remedies for present difficulties

By J. G. Lyne

Financial Editor, Railway Age

THE Canadian railways have suffered from the depression in the same manner as the lines south of the border; that is, by reduced traffic and earnings and consequent necessity for retrenchment. A closer examination of the situation of the railways in the two countries, however, reveals quite as many points of difference as of similarity. In the first place, highway competition, while it is an important and growing source of traffic losses to the Canadian railways, has by no means reached the proportions that it has in the United States.

Canadian People Friendly Toward Railways

Secondly, the Canadian people as a whole are apparently much more "railroad-minded" than they are south of the border—that is to say, there are still large popular demands for railway construction comparable to those put forth on behalf of new highways and new waterways in the United States. Shippers desiring to have the taxpayers pay a part of their freight charges are quite as likely to seek for government aid to railway transport as they are to clamor for appropriations for highways or waterways. As a matter of fact, in the Maritime provinces, freight rates now receive a 20 per cent subsidy from the government, applicable not only on the Canadian National but on the Canadian Pacific as well.

In the third place, largely because the Canadian form of government concentrates responsibility and power in the majority party, yielding no place to political free-lances such as are frequently able to delay needed legislation in the United States, Canada is coming to grips with its transport problem much more quickly than we are.

Quick Work in Getting Inquiry Started

As an illustration of this last point, it may be noted that the Prime Minister, the Rt. Hon. R. B. Bennett, only a few months ago announced his intention of appointing a Royal Commission to inquire into the transportation problem. This commission was named in November and started its work at the beginning of December. By the early part of February, when Parliament convenes, it is expected that this commission will have its report ready for presentation. The recommendation for a similar inquiry in this country was made by the Interstate Commerce Commission in its annual report to Congress and this recommendation was approved by the President in his message. Whether any action at all will be taken or whether a political investigation into the railways alone, disregarding other forms of transport, may be substituted in the place of the broader inquiry remains at this writing a question, and, if the history of previous recommendations to Congress may be taken as a criterion, may remain so even after the Royal Commission in Canada has filed its report.

Nor does the inquiry in Canada in any way corre-

spond to a Congressional inquiry. The personnel of the commission was drawn entirely from without the ranks of Parliament and includes two non-Canadians, viz., Lord Ashfield of Southwell, the chairman of the London Underground Railways, and L. F. Loree, president of the Delaware & Hudson. The Canadian members of the commission are: Rt. Hon. Lyman P. Duff, judge of the Supreme Court of Canada; Sir Joseph Flavelle, banker of Toronto; Beaudry Leman, banker of Montreal; Dr. Walter C. Murray, president of the University of Saskatchewan; and Dr. J. C. Webster, Shediac, N. B., representing the Maritime provinces. The commission, since it started to work a month ago, has held hearings in Ottawa, has journeyed to the Pacific Coast and back hearing witnesses and is now ready to proceed with its study of the situation in Eastern Canada.

Canada's system of railway regulation is much simpler than ours. There have been no statutes in the past to preclude consolidation, nor has there been a question of governmental valuation. Thus two interests of politicians, by the discussion of which they are able to divert attention in the United States from the real railway problem, are absent in Canada. Traffic has been light, earnings inadequate, and losses to private investors and the government have been tremendous. Still, by reason of less complexity of regulation and fewer opportunities for purely destructive political activity, the outlook for progress in finding a way out of present difficulties in Canada seems comparatively bright.

Railways Not Excluded from Federal Aid

Canada thinks so well of its railways that it even considers them as well as other forms of transport when a question arises as to using public funds for the aid of transport. Taxpayers' money in the United States, when used for transportation purposes, is used only for the benefit of competing forms of transport—not for the benefit of the railways. In Canada, on the other hand, government money is also used for the railways. The history behind this fact is too well-known to require detailed reiteration. It suffices to say that Canada has many more miles of railway to support than the users of those railways are willing to pay for. If they will not or cannot pay the cost as users, then they must pay as taxpayers. The Canadian National came into the hands of the government, which already operated a considerable mileage of railway, when private owners of the constituent railways were no longer able to keep them in operation and complete their construction on a purely commercial basis.

Users Not Paying Cost of Service

The various lines which came into the government's hands were consolidated under the able leadership of Sir Henry Thornton. Needless duplications of lines and other facilities among the various parts of the system were eliminated and the efficiency of the enterprise was vastly increased. Net revenues were further improved by a growth of business which reached its height in 1928, in which year net earnings for the system totaled $58,383,000, or more than enough to pay the interest on securities of the system held by the public. In the meantime, however, although the matter was given extensive study, no plan was brought forward for reorganizing the financial structure of the system to accord in any way with its earning power. It stood charged with expenditures for developmental railways and for interest arrearages owed to the government—charges which would have been scaled down or eliminated had the system been put through financial reorganization.

Now, with revenues in their third year of decline, the system will fail probably by approximately $45,000,000 in earning interest on securities held by the public. As one Canadian railway officer expressed it: "The users of transportation in our country are not only shifting a large share of the burden to the taxpayers, but the taxpayers are not assuming the burden, but are issuing bonds to meet the deficiency. This is as true in the case of railway losses which are not met out of taxes and charged off, but which are capitalized, as it is when 20-year bonds are sold to build highways which will last but ten years."

The position of the privately-owned Canadian Pacific in meeting the competition of a line which receives government assistance has, naturally, not been favorable, although, all things considered, the company has held its own remarkably well. A reduction in the dividend from 10 per cent to 5 per cent and general retrenchment was necessary. The Canadian Pacific, however, is generally the older line, serving more populous territory, whereas most of the extravagant mileage of light traffic built in the years just before the war is now included in the Canadian National system.

Amalgamation of Two Systems Not Now Planned

In 1928 the gross operating revenues of the Canadian Pacific and the Canadian National totaled $533,000,000. By 1930 this total had declined to $402,000,000 and a further decline of $80,000,000 is foreseen for 1931. The two systems, during the past year, have made great strides in reducing the amount of costly competition between them. How much further this might go without arousing public protest is a question. There has been some thought that the proper solution to the problem might be the amalgamation of the two systems under one management, thus eliminating all competition. Prime Minister Bennett, however, has definitely stated that no such radical step as this would be taken by the government without first giving the electorate an opportunity to state its views on the subject. It is plain, on the other hand, that the Royal Transport Commission will have to consider the financial structure of the Canadian National and the cost to the taxpayers of subsidizing railway users, as well as the cost of the subtle subsidies to highway transport and waterways, and the burden they also place on the taxpayers.

To quote another Canadian railway man: "The solution of our present problem, after all, is extremely simple—all we need to do is to force the users of each and every form of transport to pay for the service they get, without one bit of aid from the public treasury. Such aid from the taxpayers stimulates expansion beyond economic justification in any form of transport to which it is granted. It over-stimulated railway and waterway development in Canada and the same device is now being used to over-stimulate highway transport—all with the result that we have many, many times the transport facilities which we can put to profitable use. Similarly, placing all transport activities on a self-supporting basis in your country would end the uneconomic waste of over-construction of waterways and rural highways.

Railways' Cost Exceeds Wars'

In addressing the opening session of the Royal Transport Commission, the Minister of Railways, Dr. Manion, summarized the history of the present railway situation in Canada. Total securities of the Canadian Pacific, he gave as $910,000,000, in addition to which the government had contributed $105,000,000 in its early stages of development. The Canadian National bonds in the hands of the public he gave as $1,288,000,000. To this he added government loans of $604,000,000;

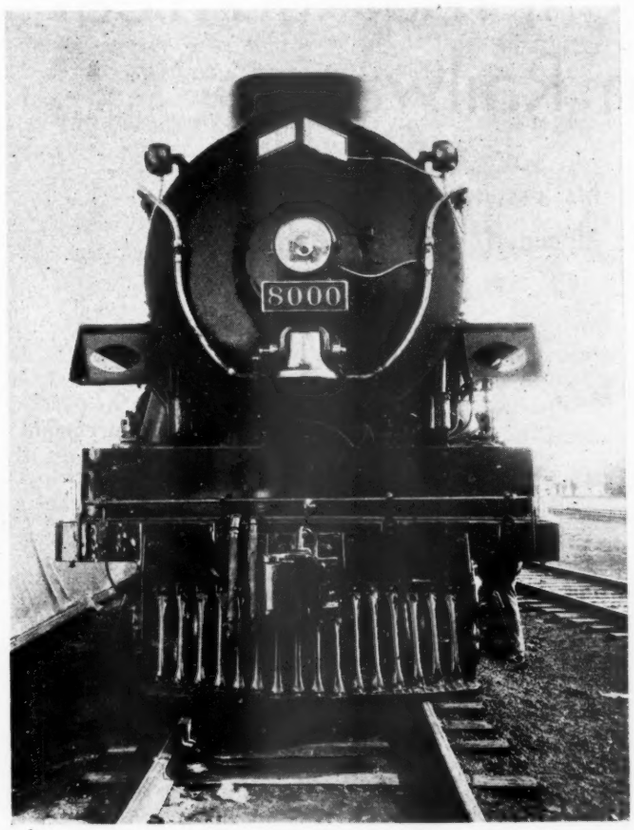
capital stock of the Canadian Northern at $10,000,000, the price paid for it (carried on C.N.R. books at $270,000,000); unpaid interest at $350,000,000; and the construction cost of the Canadian Government Railways (the Intercolonial) at $403,000,000. This gave a total of $2,655,000,000. The cost of the World War and demobilization to the Canadian Government, he said, was not more than two-thirds the cost to it of its publicly owned railways.

As one principal measure of effecting economies the railways made strenuous efforts to eliminate unremunerative passenger train service. The savings made by this measure alone are estimated at upwards of $10,000,000. In reducing train mileage the railways endeavored not to curtail service to the public any further than necessary. For example, both roads saved much train mileage by combining Montreal and Toronto sections of transcontinental trains, operating them westward from junction points in Northern Ontario as one train, this having the effect of reducing train mileage while giving the cities concerned the same service to and from the West which they had enjoyed previously.

C. N. R. and C. P. R. Co-operate

Heretofore the Canadian Pacific had used its railway and steamship lines as complementary to each other in handling traffic, each endeavoring to direct business to the other. The Canadian National, on the other hand, had its connections with foreign steamship lines. As a co-operative measure for promoting Canadian interests all around, the companies reached an agreement in the Fall whereby the Canadian National agreed to direct traffic toward Canadian Pacific steamships in return for which the Canadian Pacific undertook to throw some of the business from its steamers to the Canadian National.

Wage reductions or shortened hours were placed in effect for officers and clerical employees of both roads some months ago. In the autumn the roads started negotiations looking to a wage reduction in train, engine, yard and telegraph service. The organizations representing these employees did not accept the reduction and the question went to arbitration, the award being a victory for the railways with a 10 per cent reduction authorized. The decision was announced about the beginning of December and the roads endeavored to place it into effect as of November 15. The organizations protested against this retroactive feature, however, and were upheld. They also have thus far failed to acquiesce in the reduction, and negotiations on the question will begin early in the new year.



The C.P.R.'s Multi-Pressure Locomotive

Halt Work on Montreal Terminal

The greatest casualty of the depression, from a physical standpoint, was the Canadian National's great passenger terminal project in Montreal, work on which was well under way. It was decided that in view of the large demands for public funds and the depleted state of the treasury, work would have to be held up until the approach of better times. There was some adverse comment upon this action, on the grounds that the authorities were spending funds in other ways for unemployment relief and that this project was as much a public building job as the trans-Canada highway, work upon which is being pushed as a relief measure. On the other hand, expenditures which have to wait for several years before they become productive are everywhere difficult to finance in such times.

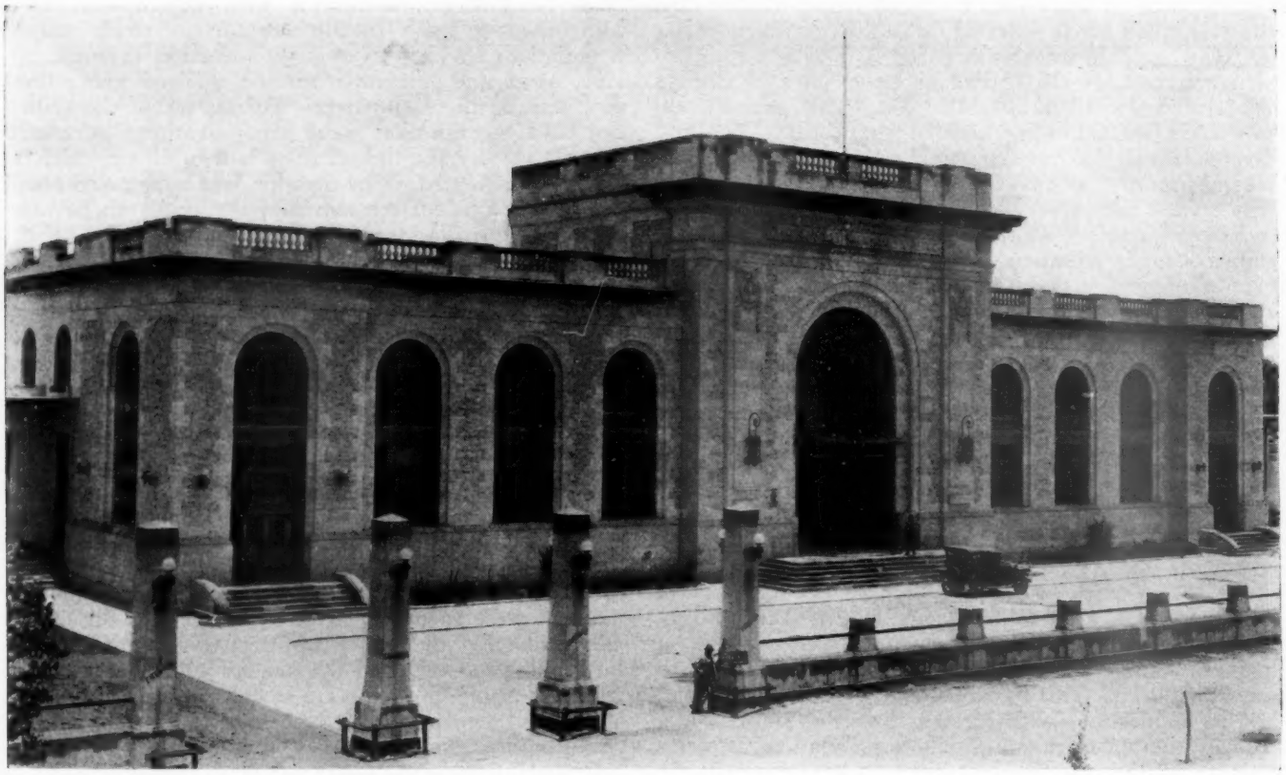
High Speed Train Service

Canada won new railway laurels in the Summer when for a time the Canadian Pacific operated the fastest train in the world. The "Royal York" between Toronto and Montreal was put on a schedule of 6¼ hours for the journey and was timed to make the run from Smith's Falls to Montreal West, 124 miles, at an average speed of 68.9 miles per hour, taking the speed crown away from the "Cheltenham Flyer" of the Great Western of England. The Great Western's train was, however, speeded up about three miles an hour once the C.P.R.'s performance became generally known. On the other hand, Canada's two principal cities, Toronto and Montreal, are probably connected by the fastest train service, on both the railways, that could be found anywhere between cities as far apart as they are.

Another Railway to Arctic Tidewater

Construction activity was not particularly heavy in the Dominion during the year. Perhaps the most interesting project was that of the Temiskaming & Northern Ontario, a line owned by the Ontario government, which laid its rails to tidewater at Moose Harbor on James Bay, thus giving the country its second railway outlet to Hudson's Bay. A total of 250 miles of new line was completed during the year. The Canadian Pacific either completed or had under way during the year some 470 miles of new line and the Canadian National about 90 miles. Several new grade separation, station and hotel projects were completed. Equipment orders were light—11 passenger cars and some 3800 freight cars. Only two locomotives were ordered—both experimental.

The Canadian railways, in sum, have had an undeniably bad year, but they are meeting their situation courageously and they have the interest and good will of the Canadian public behind them. The prospect for the future, therefore, is a heartening one, since depressions do not last forever.



The Station and Office Building at Durango, Dgo.

Drastic Retrenchment Marked Year on Mexican Railways

Reorganization of departments resulted in greater efficiency, but traffic declined sharply

MEXICO has suffered more than its share of the world's economic depression, due to the marked downward trend in the price of silver, which practically paralyzed mining activities, bringing about a loss of approximately 30 per cent of the total tonnage handled by the National Railways of Mexico. But if the road in 1930-1931 had not been in process of reorganization, the financial structure of the company would now, undoubtedly, have been very gloomy, considering the unfavorable conditions under which the lines were being operated, with their exceedingly burdensome expenses and with no immediate relief in sight, owing to certain labor factors, political influences and administrative policies.

When business falls off and conditions in general are indicative of a further decline in agricultural, industrial, mining, commercial and such other activities on which railroad transportation depends directly, there remains no recourse other than to curtail operating expenses. It has been the present management's policy to introduce such radical changes and technical measures in the administration's program, as not only to place the company's properties on a paying basis by satisfactorily meeting operating expenses, but also to obtain the legitimate and expected return on the capital invested. Considering the financial state of the company prior to 1930, the magnitude of the task will be readily comprehended. Last year witnessed technical studies and carefully planned preparatory work, and the latter half of 1931 saw the program functioning in its major portion.

The Labor Problem

The labor situation on the National Railways of Mexico has been a tangled and delicate problem to contend with, and much more so subsequent to 1914, when abrupt social movements sprouted country-wide. These developments and others seriously influenced the company's interests. The constant changes in administration prior to 1925, brought about by internal disturbances, had converted railroad positions into a sort of reward for services rendered the different revolutionary factions. As a consequence, the roads were exceedingly burdened with the maintenance of an inflated army of unnecessary employees, who were naturally doing their

utmost to hold fast to their jobs. The necessary immediate and drastic retrenchment in forces could not be precipitated without provoking serious friction with the labor unions and much uneasiness among the personnel, aside from the heavy disbursements that this procedure would have originated in the form of indemnities, as provided for in the existing labor contracts.

The management, however, could not indefinitely postpone the reduction of forces, and proceeded gradually to do so in 1930. In January, 1931, the National Railways of Mexico had 46,604 men in the service, with a monthly payroll of $5,197,854.86, while in August, 1931, the number of workers had been reduced to 34,638, a total of 11,966 men having been laid off, thereby reducing the monthly payroll to $3,968,985.12, which means a monthly saving of $1,228,869.74, equivalent to 23.6 per cent. These figures cover all payments to the personnel, including salaries, sick pay, vacations, indemnities, etc.

Fuel Performance

Fuel performance has been the subject of conscientious study and ways have been found to reduce fuel consumption considerably. The company has obtained economies in fuel expense that would have amounted to considerably more if the price of fuel had not gone up, influenced by the prevailing low rate of exchange, the fuel being paid for in United States currency.

During 1930, for example, when the lines handled 3 per cent more gross ton-kilometers than in 1927, a saving of $5,797,958.47 was effected in fuel expense, and in 1931, further substantial economies were introduced, as indicated by the cost of coal consumed per 1,000 gross ton-kilometers, which was reduced 3.7 per cent, and of 4.7 per cent in fuel oil consumption, in freight service, as compared with 1930. Of the total fuel consumption on the National lines, 90 per cent represents oil and 10 per cent coal. The cost of coal consumed per locomotive-kilometer in freight service increased 10.2 per cent and the cost for oil burners increased 3.9 per cent, but the total locomotive kilometrage was reduced 11.9 per cent by cutting off a number of unprofitable trains, and by increasing the gross train load 9.9 per cent.

It is expected that by co-ordinating the accounting work with the purchasing, general distribution and inspection, and by placing the latter responsibility under one head, a much more effective control can be obtained of this very important feature.

Budgeting, Accounting and Statistics

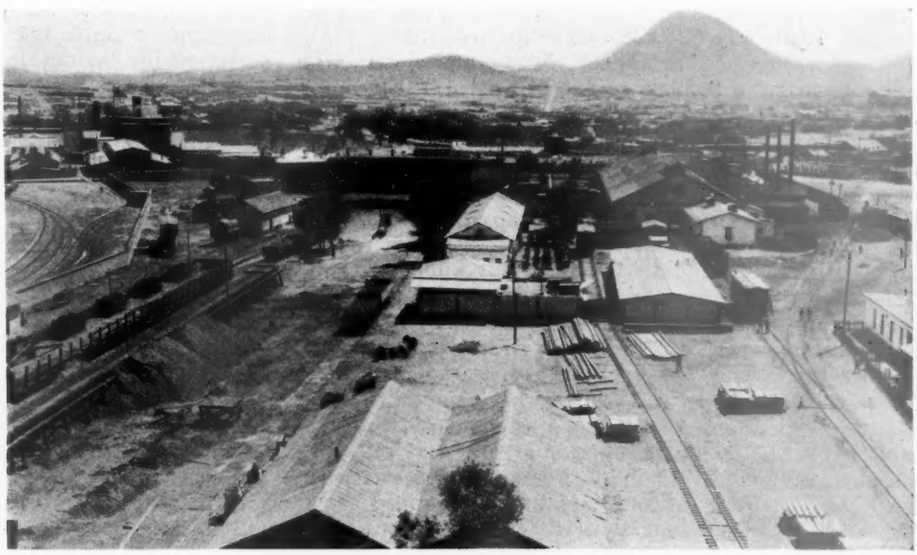
The National lines have never, in reality, depended on a budget on which to base their operating expenses, and disbursements have naturally been very difficult to control, with the ultimate result that the operating ratios have indicated an abnormal state of affairs. After considerable thought and special studies, a budget plan, based on Canadian and American methods, was established in December, 1931, through which the operating expenses will be subjected to a certain limit which is not to be exceeded unless absolutely justified by the traffic handled and by the proportionate increase in the earnings. Budgeting, in accordance with up-to-date, scientific methods, has long been needed on the National lines.

The accounting system in effect heretofore has long been dispensed with on modern roads, as under the procedure followed accounting statements were not available until 30 to 40 days after the month to which they corresponded. This method constituted a hindrance to proper budgeting, aside from all the other disadvantages from accounting and operating viewpoints. Considering that the Interstate Commerce Commission accounting procedure was what our accounting department ought to follow, and on recommendations from Canadian railroad experts, the National lines adopted the Interstate Commerce Commission Accounting Classification, and on July 1, 1931, established divisional accounting bureaus and shop accountants at the principal shops, and they are now functioning properly.

The statistical department has also been functioning since July, 1930; in fact, the reorganization in its major proportion has been based on the statistical information supplied by this department, supplemented by the corresponding studies and comments made as regards the operating results in general.

Divisional Organization

An important feature of the reorganization was the adoption of the divisional system, which made the division superintendent the local manager of his division, thereby concentrating the responsibility in one head, instead of the old departmental organization which caused constant friction and misunderstanding between the different departmental heads on the various divisions. As regards the maintenance of way department, the division engineers handle all technical matters directly with the chief engineer.



Terminal Facilities at Chihuahua, Chih.

During the month of May, 1931, the office and jurisdiction of the general superintendent of transportation were divided, with the view of decentralizing the activities of this important branch of the railroad. J. J. Franco was appointed general superintendent of transportation of the Southern district, with headquarters in Mexico City, and David S. Alonso, former superintendent of the Mexico City terminals, was appointed general superintendent of the Northern district, with headquarters at Monterrey, N. L. The 20 divisions then existing were, in the course of the latter six months of 1931 consolidated into 12. The Torreon, Centre, Guadalajara, Cardenas, Golfo and Monterrey divisions were placed under the jurisdiction of Mr. Alonso, and the Queretaro, Mexico, Pacific, Puebla-Axaca, Jalapa and Vera Cruz al Istmo-Tehuantepec-Pan-American, known as the Southeast division, were turned over to Mr. Franco. With the enlargement of divisional territories, the transportation department, in close co-operation with the mechanical department, extended locomotive runs, thereby removing from service approximately 100 locomotives, with the corresponding release of train personnel.

Operating Results

Freight and mixed train performance is being very closely checked through the transportation statistics. The net and gross tonnage handled per kilometer, gross ton-kilometers per train-hour and percentage of tractive power utilized are matters of constant attention and any decline is the subject of immediate investigation. Yard and freight station performance, road transportation unit costs, as regards salaries and fuel costs per 1,000 gross ton-kilometers, are also subjected to constant scrutiny by general and divisional officers, and prompt steps are taken to correct any abnormal results reflected through the corresponding statistics. In fact, proper supervision has been enforced in all phases of transportation and drastic, scientific measures have been introduced to eliminate waste and avoid unfavorable fluctuations in unit costs.

Aside from the contemplated concentration of principal shops at five strategic points on the system, leaving only roundhouses of major or minor importance in the balance of the territory, which will bring about a considerable reduction in forces, the mechanical department has introduced other economies, with a consequent reduction in unit costs. For example, the labor cost for repairs to locomotives per 1,000 kilometers run in September, 1930, was $289.28, while in September, 1931, this cost was reduced to $249.06. The material item also went down from $139.86 to $100.17 per 1,000 locomotive kilometers.

As regards freight car repairs, the labor cost per 1,000 car kilometers amounted to $16.16 in September, 1930, as against $11.27 in September, 1931; the cost of material used in repairs was reduced from $13.84 to $11.09. Passenger car repair costs per 1,000 kilometers were also lowered, notwithstanding the fact that kilometrage in passenger train service was reduced only 1.5 per cent. Labor costs for this item declined from $15.51 to $15.24, and material costs, from $12.68 to $12.36.

Notwithstanding the fact that operating expenses from January to August, 1931, which amounted to $50,035,847, were reduced $11,548,674 as compared with the same period of 1930, the operating ratio was only reduced to 83.14 per cent in 1931 from 86.6 per cent in 1930, due to the gross revenues having dropped from $74,474,170 to $60,544,803 for the period in question. If the operating expenses for 1931 could be compared with the gross revenues of 1930, we should have obtained an operating ratio of 67.19 per cent. If we compare the operating expenses in 1931 with those of 1929, we find that the saving is still greater, $12,788,525. These figures are eloquent in representing the results of the reorganization under the new management, as far as curtailment of expenses is concerned, although reductions parallel to the decrease in earnings are impossible without seriously affecting the efficiency of the services, which would injure the company's prestige as a reliable carrier.

The comparative efficiency can be readily judged from the following results: Net train load per kilometer increased 8 per cent, while gross tonnage increased 9.9 per cent and, notwithstanding the heavier trains handled, the average speed per hour went up 8.9 per cent, which means less delays on the road, with the ultimate result of a 10.9 per cent increase in gross ton-kilometers per train hour.

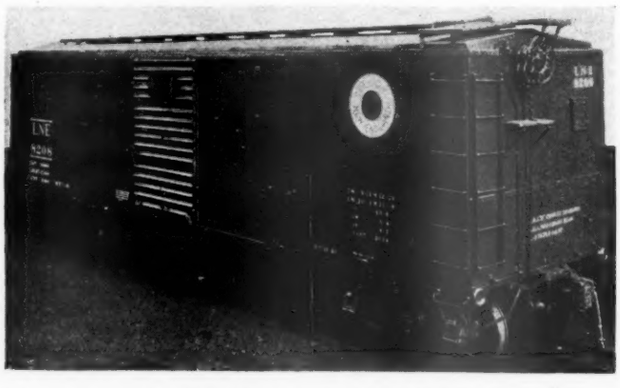
Competitive Transportation Agencies

The passenger business has suffered very materially, having been heavily affected by indirect subsidized competition of bus lines and airways, which are more than ever developing their activities. It is urgent that this unfair competition be regulated, and transportation services co-ordinated so that the privileges granted some of them do not constitute a menace to the railroads' interests. Airplane lines and buses have taken a good portion of the passenger business from the railroads, and the road building programs indicate that the motor vehicle transportation system is being encouraged with a subsidy in the form of road paving, with little or no responsibility as regards taxes and maintenance, and with absolute freedom as regards operation, there being no regulatory orders to abide by. As a consequence, the National line's passenger earnings from January to August, 1931, dropped to $11,882,531 from $14,794,369 for the previous year, the loss having been $2,911,838, or 19.7 per cent.

Another sort of competition that is being developed, and which has caused a decrease in earnings, is the movement of gas and oil through pipe lines. This will, in time, constitute a problem for the railroads to solve.

All these kinds of competition are being counteracted through various means, efficient service and a greater degree of safety being the principal arguments. Although the earnings of the railroads have suffered from such competition, the railways will constitute, for a long time to come, the most adequate means of transportation for the development of the country.

* * *



Fifty-Ton Capacity Steel Box Car Built by Magor Car Corporation for the Lehigh & New England

Seven Hundred Forty-Eight Miles of New Line Were Completed and Placed in Service During 1931

Mileage of New Lines Increases

Other construction, while heavy, was less than for peak year of 1930—Outlook for 1932 not so encouraging

By George E. Boyd

Associate Editor, Railway Age

ALTHOUGH expenditures for improvements were heavy, as compared with the previous year, 1931 witnessed a sharp reduction in the construction activities of the railways. This contrast was all the more marked, since in 1930 expenditures for improvements and extensions climaxed more than a decade of intensive development of railway facilities. Furthermore, present indications give promise that there will be further curtailment in 1932. In previous years, the number of new projects that have been started during any year approximately equalled the number of those that were completed. However, the amount of work that was completed during 1931 was not balanced by an equal amount of new work of major importance.

During the year 748 miles of new lines were completed and placed in service. This was an increase of 235 miles, as compared with 1930, and was also greater than for any year between 1917 and 1926, while it has been exceeded only three times since 1917. The number of new-line projects at the close of the year were limited, and the prospect is that the new mileage constructed in 1932 will be small.

The mileage of second, third and fourth track completed dropped sharply, but this was largely a continuation of the trend that has been so noticeable in recent years. Despite a continued increase in the volume of traffic handled up to 1929, recent improvements in equipment for directing and controlling train movements have increased the operating capacity of main tracks to such an extent that, of late, additional traffic lanes have not been required to the same extent as in former years. Rather, where it has been found that equivalent results can be obtained by installations of automatic signals, centralized traffic control, remotely-controlled power switches and other similar devices, there has been little economic justification for the more expensive multiple-track construction.

New Lines

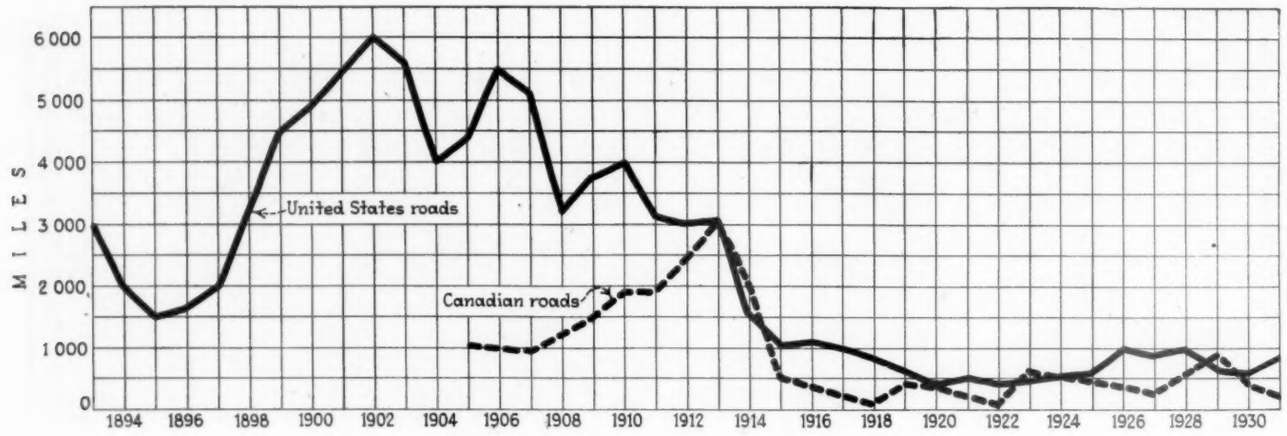
Among the more prominent new-line projects which were completed during the year, is that of the Great Northern and Western Pacific, approximately 200 miles long, between Klamath Falls, Ore., and Keddie, Cal. This line not only provides a new route from the Northwest into San Francisco, but it also provides an outlet to the East from a large area in Oregon and Northern California, which has heretofore been without railway facilities. It was opened for freight traffic early in November, although passenger service will not be instituted until next spring.

Another project, which included a group of lines totaling more than 225 miles that were constructed to develop new territory, was completed in 1931 by the Santa Fe. These lines extend into Oklahoma, Texas and New Mexico, and in the main open up areas which had no transportation facilities.

Typical of those roads that are being built to shorten existing routes or to provide better operating characteristics, was the new line of the Chicago, Rock Island & Pacific and the Chicago, Milwaukee, St. Paul & Pacific between Trenton, Mo., and Birmingham, which was opened in July, 1931. This line is not only shorter than the former route, but a large number of grade crossings have been eliminated, while the alinement and grades are greatly improved.

California Completes Largest Mileage

Texas, which has led in the amount of new mileage for three successive years, gave way to California, which moved into first place with 178 miles of new line.



New-Line Mileage Constructed in the United States and Canada

The new mileage in Texas dropped from 245 in 1930, to 155 in 1931. Missouri rose to third place with 86 miles, while in Pennsylvania, Oklahoma and New Mexico, the new mileage was 54, 53 and 48, respectively.

At the close of the year approximately 112 miles of new road were under construction, as compared with 590 miles at the close of 1930, a reduction of 478 miles. The largest of these was the line which is being built by the Colorado & Southern between Childress, Tex., and Pampa, 100 miles. The only other new line project of importance from a mileage standpoint was the extension of the line which the Virginian is building between Baileyville, W. Va., and Gilbert. In addition, there were several other projects of small mileage, such as the extension of the North End freight tracks, 0.8 of a mile, at Kansas City, Mo., by the Kansas City Terminal. Of the lines projected, it is unlikely that any considerable mileage will be built in 1932.

Miles of New Line Completed in the United States Since 1893

1893	3,024	1912	2,997
1894	1,760	1913	3,071
1895	1,420	1914	1,532
1896	1,692	1915	933
1897	2,109	1916	1,098
1898	3,265	1917	979
1899	4,569	1918	721
1900	4,894	1919	686
1901	5,368	1920	314
1902	6,026	1921	475
1903	5,652	1922	324
1904	3,832	1923	427
1905	4,388	1924	579
1906	5,623	1925	644
1907	5,212	1926	1,005
1908	3,214	1927	779
1909	3,748	1928	1,025
1910	4,122	1929	666
1911	3,066	1930	513
		1931	748

New Mileage in Canada and Mexico

The mileage of new lines completed in Canada was 250, as compared with 385 in 1930. This was the lowest since 1922, and with the exception of that year and of 1917 and 1918, it was also the lowest since 1904. As in recent years, this mileage consisted mainly of branch lines that were constructed for the purpose of developing unsettled areas in Alberta and Saskatchewan. The principal exception was the 45-mile extension of the Temiskaming & Northern Ontario, which was completed to Moose Factory, Ont., during the year, thus reaching tidewater at the south end of James bay. The completion of this line not only gives the central areas of the Dominion an additional route to Europe, through Hudson Strait, but it also gives access to the vast forest and mineral resources along the southerly and easterly shores of Hudson bay and permits their development.

Railway construction in Mexico remained practically at a standstill, as it has for several years. The only new mileage completed during the year was 4.2 miles on the Mexico-Tampico Short Line, which is being built in short increments between Mexico and Tampico, 334 miles. Fifty-two miles on this project are now in operation. All construction was completed on the line between Calles and Guerrero, 79 miles, which was placed in service last year. A large mileage of new lines is under survey or projected, but there is little prospect that much of this work will be undertaken in the immediate future.

Miles of New Lines Completed in Canada Since 1904

1904	316	1918	135
1905	1,181	1919	433
1906	1,007	1920	305
1907	976	1921	252
1908	1,249	1922	145
1909	1,488	1923	655
1910	1,844	1924	615
1911	1,898	1925	414
1912	2,232	1926	335
1913	3,013	1927	310
1914	1,978	1928	723
1915	718	1929	841
1916	290	1930	385
1917	207	1931	250

Miles of New Main Track Built in 1931

United States	Number of companies building	First Track	Second Track	Third Track	Fourth Track	Total
Arizona	1	.....	0.87	.....	.....	0.87
Arkansas	1	.....	2.37	0.04	.....	2.41
California	3	178.21	.....	0.67	0.68	179.56
Colorado	1	0.09	.....	.....	.....	0.09
Illinois	1	2.58	.....	.....	.....	2.58
Indiana	2	4.60	7.50	.....	.....	12.10
Kansas	1	26.89	.....	.....	.....	26.89
Kentucky	2	5.66	22.00	.....	.....	27.66
Michigan	2	.....	14.24	.....	.....	14.24
Missouri	4	85.53	45.53	.....	.....	131.06
Montana	1	9.00	.....	.....	.....	9.00
Nevada	2	33.09	.....	.....	.....	33.09
New Mexico	1	47.82	.....	.....	.....	47.82
New York	1	1.60	1.00	0.50	0.20	3.30
Ohio	1	6.00	.....	.....	.....	6.00
Oklahoma	2	52.47	.....	.....	.....	52.47
Oregon	2	28.40	.....	.....	.....	28.40
Pennsylvania	6	53.57	11.50	.....	.....	65.07
Texas	5	155.18	1.30	.....	.....	156.48
Virginia	2	33.20	5.39	.....	.....	38.59
West Virginia	3	20.49	.....	.....	.....	20.49
Wyoming	1	3.17	.....	.....	.....	3.17
Total, United States		747.55	111.70	1.21	0.88	861.34

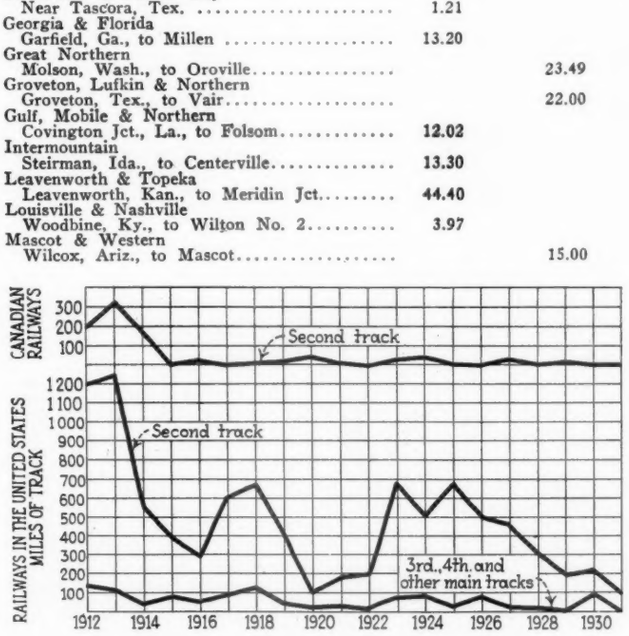
Multiple Track Mileage

As already mentioned, in the United States there was a considerable decrease in the total mileage of multiple track built in 1931 as compared with the previous year, the total for second, third and fourth track, each being less than in 1930. One hundred twelve miles of second track was placed in operation, as compared with

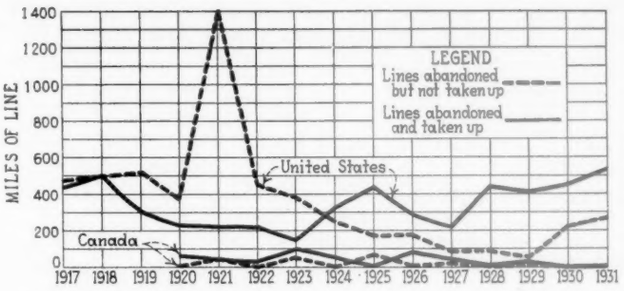
236 miles in 1930, a decrease of 124 miles or 52 per cent. Likewise the amount of third and fourth track was 1.21 miles and 0.88 mile, respectively, as compared with 71 miles of third track and 24 miles of fourth track in 1930. The longest single stretch of second track placed in operation was on the Southern between Rogers Gap, Ky., and Williamstown, 22 miles.

Lines Abandoned in the United States, Canada and Mexico

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Alaska Railroad		
Fairbanks, Alaska, to Chatanika	39.20	
Atlantic Coast Line		
Goldsboro, N. C., to Smithfield	18.50	
Bessemer & Lake Erie		
Goff, Pa., to Erico	1.22	
Boston & Albany		
Chester & Becket Jct., Mass., to Quarries	5.34	
Bridgton & Harrison		
Harrison, Me., to Bridgton		3.90
Brimstone R. R. & Canal Co.		
Brimstone Jct., La., to Lockport	7.39	
Brooksville & Ohio River		
Brooksville, Ky., to Wellsburg	10.00	
Burlington, Muscatine & Northwestern		
Wapello, Ia., to near Muscatine	19.00	
At Elrick Jct., Ia.		4.00
Carolina		
Kinston, N. C., to Snow Hill		13.20
Chesapeake & Ohio		
Mt. Sterling, Ky., to Rothwell		19.49
Chicago & North Western		
Ormsby, Wis., to end of line	0.10	
Hazel Green, Wis., to end of line	0.03	
Silas Jct., Wis., to Stiles		2.43
Beaver, Mich., to end of Beaver branch		9.55
Consol, Ia., to end of line		1.62
Manning, Ia., to Harlan		21.46
Chicago, Milwaukee, St. Paul & Pacific		
De Witt, Ia., to Long Grove	9.00	
Velasco, Wis., to Boulder Jct.		17.30
Chicago, Rock Island & Pacific		
Abilene, Kan., to Solomon	10.03	
Cleveland, Cincinnati, Chicago & St. Louis		
Beesons, Ind., to Hagerstown	13.50	
Colorado & Southern		
Blackhawk, Colo., to Central City	3.52	
Ingleside branch, Ingleside, Colo.	2.24	
Death Valley		
Death Valley, Cal., to Ryan	20.65	
Delaware & Hudson		
Honesdale Jct., Pa., to Racket Brook		23.62
Denver & Rio Grande Western		
Taos Jct., N. M., to La Madera	16.62	
Detroit, Toledo & Ironton		
Kingman, Ohio, to Pt. William	9.43	
East Jordan & Southern		
Various branch lines in Michigan		3.87
Elkin & Alleghany		
Elkin, N. C., to Vaneer	15.20	
Florida Central & Gulf		
Inglis, Fla., to Hernando	29.50	
Ft. Worth & Denver City		
Near Tascora, Tex.	1.21	
Georgia & Florida		
Garfield, Ga., to Millen	13.20	
Great Northern		
Molson, Wash., to Oroville		23.49
Groveton, Lufkin & Northern		
Groveton, Tex., to Vair		22.00
Gulf, Mobile & Northern		
Covington Jct., La., to Folsom	12.02	
Intermountain		
Steirman, Ida., to Centerville	13.30	
Leavenworth & Topeka		
Leavenworth, Kan., to Meridin Jct.	44.40	
Louisville & Nashville		
Woodbine, Ky., to Wilton No. 2	3.97	
Mascot & Western		
Wilcox, Ariz., to Mascot		15.00



Multiple Track Mileage Constructed in the United States and Canada



Mileage of Line Abandoned in the United States and Canada

United States	Lines abandoned and taken up Miles	Lines abandoned but not yet taken up Miles
Michigan Central		
Slocum Jct., Mich., to Grosse Ile	2.50	
Marble, Mich., to East Jordan	6.40	
Sallings, Mich., to Johannesburg	15.20	
Minneapolis, St. Paul & Sault Ste. Marie		
Marblehead spur, Marblehead, Mich.	0.10	
Birchwood, Wis., to Reserve	18.19	
Brantwood, Wis., to Knox Mills	4.89	
Hollister, Wis., to Camp 5	3.42	
Superior, Wis., to Ore dock	6.63	
Mississippi Eastern		
Crandall, Miss., to Theadville		1.12
Missouri Pacific		
At Creve Coeur, Mo.	0.54	
Allen, Kan., to Red Wing	25.82	
Luna, Ark., to Lake Village	6.27	
At Oronogo, Ark.	1.35	
Nashville, Chattanooga & St. Louis		
Stewarts, Tenn., to Arnold		2.64
Centerville, Tenn., to Rochelle		5.72
Northern Pacific		
Boomerang, Mont., to Queen Siding	19.61	
Ohio Central Lines (N. Y. C.)		
North Corning, Ohio, to Drakes		4.11
Ontonagon		
Ontonagon, Mich., to Green		7.00
Oregon Electric		
At Portland, Ore.	1.17	
At Albany, Ore.	1.26	
Oregon Short Line		
Blaxon Jct., Ida., to Cumberland	7.41	
Moyer Jct., Wyo., to Conroy		1.89
Pearl River Valley		
Crosby, Miss., to Rowlands	9.60	
Pennsylvania		
Leskie, Pa., branch	0.13	
Mapleton, Pa., branch	0.20	
New Wilmington, Pa., to Sharpsville	13.39	
Morgan Run, Pa., branch		0.44
Haddonfield, N. J., to Medford		9.85
Key, Ohio, to Woodsfield		30.70
Reading		
Philadelphia, Pa.	0.30	
Wilmington, Del.	0.02	
New Holland branch, Hazel Dell, Del.	0.04	
Rio Grande & Eastern		
In Sandoval county, N. M.		13.00
Seaboard Air Line		
Leonton, Fla., to end of line	8.80	
South Georgia		
Perry, Fla., to Hampton Springs	5.60	
Southern Pacific		
Flux, Ariz., to Calabasas	13.04	
Filbin, Cal., to Candelaria		5.23
Susquehanna River & Western		
Blain, Pa., to Germantown	4.00	
Valley River		
Mill Creek, W. Va., to Valley Head	15.80	
Washington Run		
Star Jct., Pa., to Layton	4.10	
Western Maryland		
Ganahurst, W. Va., to Weaver	4.79	
West Virginia Midland		
Diana, W. Va., to Webster Springs	12.91	
Total	532.05	262.63
Canada		
Pacific Great Eastern		
Squamish subdivision	3.05	
Squamish and Lillooet subdivision		3.30
Mexico		
Cananea Consolidated Copper Company's Railway		
Kilometer 14, Cananea, Son., to Km. 18	2.50	

The next longest was the joint track of the Milwaukee and the Rock Island, between Birmingham, Mo., and Moseby Jct., 20 miles, on the new line to Kansas City.

Miscellaneous Projects of Magnitude

The New York Central continued work on its West Side improvements in New York, which is the largest single railway project now under way in this country.

This project, some of the units of which are now completed, involves an ultimate expenditure of $175,000,000. Included in the work that is finished or is yet to be done is the relocation and elevation of its tracks on the west side of Manhattan, the elimination of 90 street crossings at grade, the construction of an elevated express highway covering the tracks and a large amount of miscellaneous construction, which includes warehouses, freight houses, team yards and other freight facilities.

The next largest railway project is the electrification program of the Pennsylvania. Originally involving the main line between New York and Philadelphia only, it has been extended to Washington, D. C. This road also has a program of major improvements, including the Philadelphia-Washington extension of the electrification, which will involve an ultimate expenditure of $175,000,000. It was originally intended to spread this work over four years, but early in 1931, owing to lower commodity prices, the favorable conditions for obtaining labor and the ability to secure prompt deliveries of materials, it was decided to shorten this time to two and a half years. During the past year work has been prosecuted actively on all of the items included in this program.

The Reading has made satisfactory progress on the electrification of its suburban lines out of Philadelphia. Work on a number of these lines is already finished, the Chestnut Hill branch being furthest from completion by reason of the extensive grade-separation work that is required on this line as a preliminary to the electrification. It is expected, however, that the entire project will be finished and in operation by the end of 1932.

Grade separation continued to be a heavy burden on the railways, the expenditures for this class of work in 1931 making up a large part of the total capital expenditures. The Indianapolis Union Railway continued work on its track elevation in Indianapolis, Ind., the total cost of which will approximate $13,000,000. Numerous other projects were under way or completed during the year, ranging in importance from a single crossing of a country highway to track elevations in cities, involving a large number of street crossings.

Three important passenger stations were completed in 1931: A union station at Tulsa, Okla., and a joint station to serve the Frisco and the Rock Island at Oklahoma City, Okla., each of which cost $2,500,000; and a combined station and office building at Ft. Worth, Tex., which the Texas & Pacific completed at a cost of $1,500,000. The Pennsylvania continued work on its $60,000,000 Philadelphia terminal. The second largest project of this character under way during the year was the Cincinnati Union Terminal.

Among the major bridge projects that were under way during the year was the Wabash bridge across the Missouri river at St. Charles, Mo., which involves an expenditure of $5,500,000. At the end of the year a similar bridge over this river for the Missouri-Kansas-Texas was nearing completion at Boonville, Mo.

During the year the Chesapeake & Ohio prosecuted work on 10 tunnel projects, one of which was completed, while another involved the conversion of a tunnel into an open cut. The total cost of all of these projects will be $10,033,500.

Increase in Mileage of Lines Abandoned

There was an increase of 101 miles in the lines abandoned in the United States, the total for the year being 795 miles, which is 47 miles in excess of the mileage of new lines completed during the year. This compares with a net decrease of 181 miles of main line in 1930, a net increase of 91 miles in 1929 and of 513 miles in 1928. The largest abandonment during the year was that of the Leavenworth & Topeka, which discontinued operation on its entire railway, 44.4 miles. The Alaska Railroad came next with 39.2 miles between Fairbanks, Alaska, and Chatanika. The Ohio River & Western, a line of the Pennsylvania, abandoned 30.7 miles between Key, Ohio, and Woodsfield. The famous Death Valley Railway also abandoned operation during the year and took up its track, 20.65 miles.

Railway Construction in the United States

Alaska Railroad

Important Work Undertaken: Replacement of wooden bridge over east fork of Chulitna river with steel spans, mile 292.3, $112,000 (20 per cent completed).

Albany Port District Railroad

First Track: At Rensselaer, N. Y., 0.6 mile. At Albany, N. Y., 1 mile.
Second Track: At Albany, N. Y., 1 mile.
Third Track: At Albany, N. Y., 0.5 mile.
Fourth Track: At Albany, N. Y., 0.2 mile.
Important Work Undertaken: New line under construction, Albany, N. Y., 1 mile. Terminal yard to serve elevator and water front, in addition to classification yard, Albany, N. Y., $209,000 (40 per cent completed).

Algers, Winslow & Western

First Track: Algiers, Ind., 4.6 miles.

Atchison, Topeka & Santa Fe

First Track: (Elkhart & Santa Fe) Texas-Oklahoma state line to Boise City, Okla., 21.36 miles. Felt, Okla., to Clayton, N. M., 23.68 miles. Mt. Dora, N. M., to Gladstone, 35.55 miles.
(Gulf, Colorado & Santa Fe) Sena Jct., Tex., to Thompson, 16 miles.
(Panhandle & Santa Fe) Heaton, Tex., to Coltexo, 8.24 miles. Amarillo, Tex., to the Texas-Oklahoma state line, 100.97 miles. Spearman, Tex., to Morse, 19.48 miles.
Second Track: At Winslow, Ariz., 0.87 mile.
Important Work Undertaken: Passenger and freight station, additional yard facilities, subways and viaducts, Streator, Ill. (completed). Revision of alinement and new bridge over Illinois river, Chillicothe, Ill. (completed). Renewal of Bridge 323-B over Chariton river, Elmer, Mo. (completed). Office building, platforms, bolt house at rail mill and frog shop, Newton, Kan. (completed). Renewal of Bridge 353.6 over North Canadian river, Canton, Okla. (completed). Timber-treating plant, Wellington, Kan. (completed). Renewal of Bridge 617-D over Fountain river, Pueblo, Colo. (completed). Rearrangement of crossovers and installation of remote control switches, Holiday, Kan., to Olathe, for reversal of traffic (completed). Grade separation, Avenues 19 and 26 and San Fernando road, Los Angeles, Cal. (completed). Grade separation Forty-Seventh street and Archer avenue, Chicago (10 per cent completed). Track elevation and new station facilities, Oklahoma City, Okla. (20 per cent completed). New water supply system, Indian Gardens, Grand Canyon, Ariz. (10 per cent completed).
(Gulf, Colorado & Santa Fe) Addition to general office building, Galveston, Tex. (completed).
(Panhandle & Santa Fe) Renewal of Bridge 533.4 over North Wichita river, Foard City, Tex. (completed). Renewal of Bridge 545.7 over South Wichita river, Benjamin, Tex. (completed). Renewal of Bridge 557.3 over Salt Fork of Brazos river, Knox City, Tex. (completed).

Baltimore & Ohio

Second Track: Rand, Pa., to Bruceton. 5 miles. Gilkeson, Pa., to Thomas, 1.25 miles.
Important Work Undertaken: (Staten Island Rapid Transit) Industrial track to serve Gulf Refining Company, Gulfport, S. I., N. Y. $475,000 (completed). Separation of grades at Bay street, Clifton, S. I., N. Y., $1,205,000 (65 per cent completed). Elimination of grade crossing, South avenue, Arlington, S. I., N. Y., $430,000 (5 per cent completed).
Relocation and elevation of tracks through South Philadelphia, Philadelphia, Pa., B. & O. proportion, $4,400,000 (88 per cent completed). Elimination of grade crossing, Aiken, Md., $160,000 (completed). New industrial branch, Marley Neck branch, Baltimore, Md., $1,530,000 (completed). Improvement and extension of Russell street, Baltimore, Md., $120,000 (completed). Elimination of grade crossing, Relay, Md., Bridge 9-B, $150,000 (completed). Elimination of grade crossing, Elkridge, Md., Bridge 10-C, $100,000 (completed). Reconstruction of tracks to provide for head-on connection between Potomac yard and Brunswick, Hyattsville, Md., $220,000 (10 per cent completed—work deferred). Construction of freight house and team tracks, Silver Spring, Md., $304,515 (30 per cent completed—work deferred).
Elimination of grade crossing, Gaithersburg, Md., $200,000 (completed). Relocation of line, changes in tunnel, and new bridge over Potomac river, Harpers Ferry, W. Va., $950,000 (completed). Construction of additional team tracks, Winchester, Va., $110,000 (completed). Elimination of grade crossing, Kearneysville, W. Va., $200,000 (completed). Renewal of Bridge No. 78, Keyser, W. Va., $110,000 (completed). Constructing enlarged passenger, freight and yard facilities on new location, Johnstown,

Pa., $365,000 (30 per cent completed—work deferred). Construction of float bridge and car dumper, Glenwood, Pa., $217,000 (completed). Revision of alinement, construction of second track and additional passing siding, Rand, Pa., to West Alexander, $506,200 (completed). Elimination of grade crossing at Second avenue and construction of additional tracks, Pittsburgh, Pa., $555,720 (85 per cent completed). Replacement of overhead Bridge No. 363-A, Ellwood, Pa., $102,300 (completed).

Elimination of grade crossings, Wittmer, Pa., to Mt. Royal, $685,000 (5 per cent completed). Rehabilitation of line, construction of second track, sidings and storage tracks and improving and enlarging enginehouses, turntables, etc., Fairmont, W. Va., to Lorain, Ohio, $3,539,554 (completed). Grade separation, East Thornton street, part of Group 2, Akron, Ohio (joint with Pennsylvania) B. & O. proportion, $125,000 (50 per cent completed). Relocation of C. T. & V. branch, account of municipal airport, Kumroy, Akron, Ohio, $150,000 (completed). Construction of warehouse at pipe dock, Cleveland, Ohio, $113,000 (completed). Western Hills viaduct (Cincinnati Union Terminal) Cincinnati, Ohio, $3,457,000, B. & O. proportion, $950,000 (80 per cent completed).

Separation of grades, Skillman avenue, Glendale, Ohio, $105,000 (completed). Addition to west yard, South Hamilton, Ohio, $225,000 (completed). Separation of grades between Second street and Miami river, Dayton, Ohio, B. & O. proportion, $2,671,600 (96 per cent completed). Reconstruction of Bridge 3, North Dayton, Ohio, $120,000 (completed). Elimination of grade crossing, Credersville, Ohio, $100,000 (completed).

Track elevation, Seventy-Ninth street, Chicago, B. & O. proportion, $245,000 (completed). Track elevation, Eighty-Third street, Chicago, B. & O. proportion, $136,000 (completed). Track changes and construction of new bascule bridge over Chicago river, in connection with straightening the river channel, Chicago, $1,300,000 (completed). Grade separation, Fifteenth street and Stewart avenue, Chicago, B. & O. proportion, $1,685,000 (completed). Track elevation between Seventy-Ninth street and Western avenue. Chicago, $282,000 (completed). Track elevation between Western avenue and Eighty-Third street, Chicago, $97,000 (completed).

Belt Railway of Chicago

Important Work Undertaken: Diversion of Harlem avenue and separation of grades, Clearing, Ill., $341,900 (70 per cent completed).

Bessemer & Lake Erie

Important Work Undertaken: Revision of alinement, Coolspring, Pa., to Fredonia, $230,000 (completed).

Boston & Maine

Important Work Undertaken: Line change to eliminate two grade crossings, Johnsonville, N. Y., $230,000 (completed). Track elevation to eliminate a grade at Parker street, Lawrence, Mass., and construction of station facilities, $855,000 (completed). Boston Terminal improvement, new drawbridges, rearrangement of tracks and yards and electro-pneumatic interlocking, Boston, Mass., $3,325,000 (90 per cent completed).

Boulder City—Hoover Dam

First Track: Line from Boulder City, Nev., to rim of Colorado River canyon, 10.4 miles, $653,000 (constructed by the Bureau of Reclamation, United States Department of the Interior).

Important Work Undertaken: Line from rim of Colorado River canyon to site of Hoover dam, 20 miles (under construction by Six Companies, contractors for Hoover dam).

Buffalo & Susquehanna

First Track: Between Hull, Pa., and Corbett, 0.02 mile.

Canadian National (Lines in U. S.)

Second Track: Royal Oak, Mich., to Pontiac, 11.75 miles. On Pontiac Belt Line, Pontiac, Mich., 2.18 miles.

Important Work Undertaken: Grade separation, Eight mile road, Detroit, Mich. (completed). Dequindre grade separation from Jefferson avenue to Hale street, inclusive, involving twenty-two streets at grade, Detroit, Mich. (completed). Grade reduction and four-track development, Pontiac, Mich. (completed). Ferry slip and docks, Muskegon, Mich. (to be completed in 1932). Separation of grades, South Bend, Ind. (to be completed in 1932). Engine terminal, Pontiac, Mich. (completed).

Central of New Jersey

Important Work Undertaken: Elimination of 19 street crossings and two railway crossings at grade, including new station and interlocking and main track and yard changes, Elizabeth, N. J., $1,500,000 (10 per cent completed). Elimination of grade crossing at North Lincoln avenue, Elberon, N. J., $110,000 (completed). Replacement of viaduct, Nesquehoning Valley branch, Hometown, Pa., $217,000 (completed).

Charleston & Western Carolina

Important Work Undertaken: Replacing wooden trestle approaches to bridge over Savannah river with concrete ballast-deck trestle and construction of new steel drawbridge, Augusta, Ga., $537,000 (85 per cent completed).

Chesapeake & Ohio

First Track: Surveyor, W. Va., to Mile Post 5, 5 miles.

Second Track: Buchanan, Va., to Springwood, 5.05 miles. At East Alleghany, Va., 0.34 mile.

Important Work Undertaken: New coal pier, Newport News, Va., $2,210,000 (completed). Double-track bridge over Main street, Gordonsville, Va., $105,200 (completed). Enlargement and relining Lakes tunnel, Backbone, Va., $407,000 (95 per cent completed). New single-track tunnel parallel to Lewis tunnel, Jerry's Run, Va., $1,461,000 (65 per cent completed).

Enlargement and relining of Kelly's tunnel, Jerry's Run, Va., $190,000 (41 per cent completed). New single-track tunnel parallel to Alleghany tunnel and lining part of Alleghany tunnel, $1,660,000 (65 per cent completed). New double-track Second Creek tunnel, new bridge over Greenbriar river and line revision, Rockland, W. Va., $1,148,000 (32 per cent completed). New single-track Mann's tunnel, Ft. Springs, W. Va., $416,500 (75 per cent completed). New single-track tunnel parallel to Big Bend tunnel, Talcott, W. Va., $2,471,000 (65 per cent completed). Enlargement and double tracking of Stretchers Neck tunnel, and grade revision, Prince, W. Va., $1,124,000 (40 per cent completed). Construction of second track and revision of line around Blue Hole tunnel and the conversion of Popes Nose tunnel into an open cut, Cotton Hill, W. Va., to Gauley, $1,156,000 (33 per cent completed).

Two highway bridges over Big Sandy river and C. & O. tracks, and rearrangement and extension of station, Prestonburgh, Ky., C. & O. proportion, $151,400 (completed). Extension to westbound classification yard, Russell, Ky., $583,000 (completed). Construction of undergrade crossing, Bellevue, Ky., $100,000, (completed). Waterproofing 21 bridges, Marshall, Ohio, to Columbus, $178,500 (12 per cent completed). Construction of overhead highway bridge, Walbridge, Ohio, $323,000 (completed). Additional track facilities at ore and coal docks, Presque Isle, Toledo, Ohio, $207,000 (completed). Coal and ore docks, Presque Isle, Toledo, Ohio, $6,867,948 (completed). Undergrade crossing, Canal Winchester, Ohio, $104,627 (completed).

Five additional storage warehouses, Newport News, Va., $151,400 (completed). Extension of passing siding and rearrangement of water station facilities, Buchanan, Va., $101,000 (completed). Improvements to locomotive shop, Clifton Forge, Va., $153,460 (completed). Engine terminal improvements, Clifton Forge, Va., $705,000 (completed). Enlargement of White Sulphur tunnel, White Sulphur, W. Va., $118,500 (completed). New passenger station and car parking tracks, White Sulphur, W. Va., $166,700 (completed). Light repair yard and incidental buildings, Hinton, W. Va., $214,800 (completed). Rebuilding the locomotive shops, Huntington, W. Va., $3,633,400 (completed). Construction of freight car shops, Russell, Ky., $3,165,325 (completed). Rebuilding old bridge over Ohio river for highway purposes between Covington, Ky., and Cincinnati, Ohio, $923,200 (completed). Annex of 1,000,000-bu. capacity to Calumet grain elevator A, South Chicago, Ill., $344,500 (completed). Elimination of grade crossing at Dennison avenue, Columbus, Ohio, $272,265 (completed). Construction of new southbound yard, Walbridge, Ohio, $830,000 (completed).

Chicago & North Western

Important Work Undertaken: Elevation of tracks through Kenosha, Wis., 1.8 miles, and construction of elevated yard, work being done in sections, expenditure for 1931, $1,395,000 (97 per cent completed). Construction of additional feeding sheds, elevator, water lines, drainage, etc., West Chicago, Ill., $126,000 (completed). Construction of yard and teaming facilities, West Allis, Wis., (40 per cent completed). Construction and reconstruction of bridges at various points, $301,960 (90 per cent completed).

Chicago, Burlington & Quincy

Important Work Undertaken: Revision of passenger yard, Chicago, $1,997,164 (72 per cent completed). Rearrangement of tracks west of Canal street, Chicago, $570,000 (87 per cent completed). Separation of grades, Canal and Sixteenth streets, Chicago, C. B. & Q. proportion, $1,000,000 (completed). Railway express facilities, Chicago, $447,369 (completed). Rearrangement of existing facilities and extension of eastbound yard, Galesburg, Ill., $3,000,000 (75 per cent completed). Installation of through-truss lift span over Illinois river, Oglesby, Ill., $287,672 (25 per cent completed). Replacing coach shop destroyed by fire, Aurora, Ill., $189,000 (75 per cent completed). Construction of banana warehouse, Minneapolis, Minn., $215,977 (completed).

Chicago, Milwaukee, St. Paul & Pacific

First Track: Moseby, Mo., to Moseby Jct., 1.5 miles. Lawson, Mo., to Lawson Jct., 0.42 mile. Polo, Mo., to Birmingham, 20.01 miles (joint with Chicago, Rock Island & Pacific).

Second Track: Moseby Jct., Mo., to Birmingham, (joint with Chicago, Rock Island & Pacific), 20.01 miles.

Important Work Undertaken: Track elevation between Church and Isabella streets, Evanston, Ill., 1.5 miles, $2,000,000 (92 per cent completed). Revision of alinement, reduction of grades, and construction of second track and connecting tracks, Polo, Mo., to Birmingham, $2,300,000 (completed). Track elevation 2.65 miles, track depression 2 miles, eliminating 14 crossings at grade; reduction of grade from 1.1 per cent to 0.65 per cent; and construction of two new freight yards, Northern division, Milwaukee, Wis., $4,000,000 (80 per cent completed).

Chicago, Rock Island & Pacific

First Track: Trenton, Mo., to Birmingham, 76.58 (of this 20.01 is joint with the Chicago, Milwaukee, St. Paul & Pacific).

Second Track: Trenton, Mo., to Shearwood, 10.75 miles.

Important Work Undertaken: Construction of subway under St. Charles Air Line and dock house and lighterage platform on Chicago river, Chicago, $125,000 (completed). Track elevation, Illinois Deep Waterway project, Joliet, Ill., $1,413,000 (97 per cent completed). Track elevation, South Chicago, $1,200,000 (93 per cent completed, no work done during year). Construction of reinforced concrete elevator annex and incidental facilities, Armourdale, Kan., $290,000 (completed). Construction of union station, Oklahoma City, Okla., (joint with St. Louis-San Francisco), $1,025,000 (completed). Construction of subway, Walker avenue, Oklahoma City, Okla. (joint with St. Louis-San Francisco), $262,000 (completed). Construction of subway, Robinson avenue, Oklahoma City, Okla. (joint with St. Louis-San Francisco), $320,000 (completed). Elimination of grade crossings at various points on system, $350,000 (completed).

Chicago Union Station

Important Work Undertaken: Construction of new power plant to replace old power plant dismantled to accommodate the construction of the new Chicago post office, $2,000,000 (to be completed in 1932).

Cincinnati Union Terminal

Important Work Undertaken: Construction of union passenger terminal, Cincinnati, Ohio, $41,000,000 (42 per cent completed).

Colorado & Southern

First Track: (Ft. Worth & Denver City) Near Tascosa, Tex., 1.16 miles (relocation).

New Line Under Construction: (Ft. Worth & Denver Northern) Childress, Tex., to Pampa, 100 miles.

Important Work Undertaken: Replacement of 1,991 ft. of pile trestle over Canadian river with deck plate-girder spans on concrete piers and 800 ft. of ballast-deck pile-trestle approaches, north of Amarillo, Tex., $290,000 (completed).

Delaware, Lackawanna & Western

Important Work Undertaken: Elimination of grade crossing, Liberty street, Binghamton, N. Y. (completed). Construction of two reinforced concrete bridges over new state highway, Route 30, Washington, N. J., and Hampton (90 per cent completed). Construction of reinforced-concrete overhead highway bridge and a concrete pedestrian subway, New Providence, N. J. (75 per cent completed). Reinforced concrete viaduct to

eliminate grade crossing, Painted Post-Campbell highway, Painted Post, N. Y. (completed). Elimination of grade crossings at Austin, Tonawanda, Hamilton, Gorton, Amherst, Thompson and Parish streets, Black Rock, Buffalo, N. Y. (45 per cent completed).

Denver & Salt Lake

Important Line Projected: New line between Dotsero, Colo., and Orestod, 41.3 miles, to connect with the Denver & Rio Grande Western, $2,555,000.

Detroit, Toledo & Ironton

Important Work Undertaken: Grade separation, Outer Drive boulevard, Detroit, Mich., $175,000 (75 per cent completed).

Duluth, South Shore & Atlantic

Second Track: At Marquette, Mich., 0.31 miles.
Important Work Undertaken: Construction of new ore dock, Marquette, Mich., $1,800,000 (80 per cent completed). Change in alinement of main line 1.42 miles, and general rearrangement of ore yards and shop tracks, Marquette, Mich., $165,000 (completed).

Elgin, Joliet & Eastern

Important Work Undertaken: Addition to existing yard and construction of two new yards, South Chicago, Ill. (completed).

Erie

Important Work Undertaken: Elimination of grade crossings, Section A-2, Paterson, N. J. (completed). Construction of new passenger station Jamestown, N. Y. (to be completed in 1932). Construction of new local and interchange yard, and relocation and reconstruction of engine terminal, McCoy Street yard, Akron, Ohio (completed). Wholesale produce terminal and market, Buffalo, N. Y. (completed). Construction of Pier 8, timber and piles with pier house, Jersey City, N. J. (completed).

Fairport, Painesville & Eastern

First Track: Painesville, Ohio, to Harpersfield township, 6 miles.

Galveston Wharf Company

Important Work Undertaken: Construction of a concrete, electrically operated export elevator of 6,000,000-bu. capacity, Galveston, Tex., $3,000,000 (completed).

Great Northern

First Track: Klamath Falls, Ore., to Malin, 25.23 miles. Malin, Ore., to Bieber, Cal., 66.35 miles.
New Line Under Construction: Relocation of line, Bend, Ore., to Wanoga, 21.53 miles.
Important Work Undertaken: Power plant, Williston, N. D., $145,000 (completed). Power plant, Great Falls, Mont., $201,550 (completed). Power plant, Whitefish, Mont., $130,000 (completed). Coal and cinder-handling facilities and track changes, Brockton, Mont., and Wagner, $176,300 (completed). Coal and cinder-handling facilities and tracks, Glasgow, Mont., $129,700 (completed). Grade separation, Northeast Minneapolis, $431,300 (completed).

Highpoint, Thomasville & Denton

Important Work Undertaken: General office, heating plant and siding, High Point, N. C., $100,000 (90 per cent completed—work deferred).

Houston Public Belt

First Track: Extension of North Side Belt to east side of Green's Bayou, Houston, Tex., 3.33 miles, $142,120.

Illinois Central

First Track: (Chicago & Illinois Western) Between Lockport, Ill., and Joliet, 2.58 miles.
Important Work Undertaken: Replacing swing span with bascule-lift bridge, over Green river, Rockport, Ky., $339,600 (65 per cent completed). Extension of yard, East St. Louis, Ill., $299,600 (completed). Replacing freight house destroyed by fire, East St. Louis, Ill., $176,000 (completed). Randolph Street suburban terminal and west end of Randolph Street viaduct, $1,357,000 (completed).

Illinois Terminal

First Track: In St. Louis, Mo., 2.38 miles.
Second Track: In St. Louis, Mo., 2.38 miles.
Important Work Undertaken: Six-track subway and construction of three tracks, St. Louis, Mo., $1,500,000 (85 per cent completed). Construction of double-track steel elevated structure, St. Louis, Mo., $2,000,000 (completed). Construction of new passenger station (to be completed in 1932).

Indianapolis Union Railway

Important Work Undertaken: Relocation of locomotive repair shop, elevation of tracks to eliminate 23 street crossings and 4 railway crossings at grade, construction of 5-track bridge 800 ft. long over White river and construction of new classification yard, Indianapolis, Ind., $13,000,000 (22 per cent completed).

Kansas & Oklahoma

New Line Projected: Woods, Kan., to Hugoton, 14 miles.

Kansas City Southern

Important Work Undertaken: Construction of 1,000,000-bu. annex to Norris grain elevator, Kansas City, Mo., $225,000 (completed). Construction of 550,000-bu. annex to Kansas City Southern elevator, Kansas City, Mo., $122,500 (completed). New storage yard and grade crossing elimination, Sugar Creek, Kansas City, Mo., $165,000 (completed). River-bank protection, Arkansas river, Redland, Okla., $140,341 (completed). River-bank protection, Braden Bend, Arkansas river, Braden, Okla., $101,332 (completed).

Kansas City Terminal

Important Work Undertaken: Extension of 0.8 mile to North End freight line, including one street viaduct and one railway undercrossing, Kansas City, Mo., $700,000 (1 per cent completed).

Kentucky & Indiana Terminal

Important Work Undertaken: Track elevation, two miles, to separate grades at five streets, Louisville, Ky., $775,000 (completed).

Long Island

Important Work Undertaken: Additional substations and equipment, and transmission lines at various points, $1,466,300 (65 per cent completed). Grade separation, Linden boulevard, Brooklyn, N. Y., $368,300 (10 per cent completed). Elimination of four grade crossings, Ozone Park, L. I., $2,278,000 (completed). Elimination of five grade crossings and construction of jump-over bridge, Jamaica East, $6,934,000 (completed). Track elevation to eliminate grade crossing, Carlton avenue, East Islip, L. I., $229,800 (30 per cent completed). Replacing bridge over Shinnecock canal with heavier structure, Hampton Bays, L. I., $120,000 (completed).

Louisville & Nashville

Important Work Undertaken: Track elevation to eliminate four grade crossings, and rearrangement of tracks and buildings, Birmingham, Ala., $4,000,000 (85 per cent completed). Elimination of three grade crossings, Covington, Ky., $365,000 (completed). Reconstruction of viaduct over Doe Run, between Louisville, Ky., and Henderson, $293,000 (completed). New bridge across Big Hatchie river, Memphis division, $106,000 (completed). Reconstruction of bridge, including draw span, over Tennessee river, Danville, Tenn., $800,000 (20 per cent completed). New bridge, 9,882 ft. long, over Ohio river and undercrossings at four streets, Henderson, Ky., $3,748,000 (10 per cent completed). New bridge over Cumberland river, Nashville, Tenn., $221,000 (completed). Construction of bulkhead and filling Commandencia wharf, Pensacola, Fla., $132,620 (completed).

Maine Central

Important Work Undertaken: (Portland Terminal Company) New pile and timber wharf for miscellaneous cargoes, Portland, Me., $700,000 (completed).

Minneapolis & St. Louis

Important Work Undertaken: Fruit warehouse, Minneapolis, Minn., $100,000 (completed).

Missouri-Kansas-Texas

First Track: (Beaver, Meade & Englewood) Eva, Okla., mile post 85.95 to mile post 105.65 near Keyes, 19.7 miles.
Important Work Undertaken: Reinforced concrete addition of 1,055,000-bu. capacity to M-K-T elevator, Kansas City, Mo., $185,000 (completed). New bridge over Missouri river and removal of existing structure, Boonville, Mo., $1,000,000 (90 per cent completed). Reinforced concrete viaduct for state highway over Waxahachie creek, M-K-T and Burlington-Rock Island tracks, Waxahachie, Tex., $200,000, M-K-T proportion, $42,500 (completed). Grade separation, South Main street, Ft. Worth, Tex., $103,000, M-K-T proportion, $49,000 (completed). Grade separation, Corinth street, Dallas, Tex., $300,000, M-K-T proportion, $35,000 (15 per cent completed).

Missouri Pacific

First Track: Jedburg, Mo., to Eureka, 4.62 miles. At Wellington, Mo., line revision, 0.03 miles. At Pueblo, Colo., 0.09 miles. Allen, Kan., to Red Wing, 26.89 miles.
Second Track: Jedburg, Mo., to Eureka, 10.53 miles. Cobbler, Mo., to Eton, 1.86 miles. Extension of second track, Walnut Ridge, Ark., 0.82 miles. Extension at Bald Knob, Ark., 1.55 miles. Extension at Little Rock, Ark., 0.04 mile.
Important Work Undertaken: Connection at south approach to Municipal bridge over Mississippi river, including four crossings and interlocking, St. Louis, Mo., $152,000 (completed). Reconstruction of double-track incline on new alinement, East Ivory, Ill., $165,000 (completed). Replace three-track arch and embankment with three track bridge, River des Peres improvement, West Ivory, Mo., $353,000 (50 per cent completed). Relocation of main line, Wickes, Mo. (completed). Revision of alinement to eliminate curvature and reduction of grades, Pilot Knob, Mo., $100,000 (completed).
Construction of 12 miles of second track, Lake Hill, Mo., to Eureka, $4,573,375 (completed). Reconstruction of Bridge 149 on improved alinement, Wellington, Mo., $193,000 (completed). Replacing Bridges 104 and 110 with concrete culverts and embankments, Marvel Cave, Mo., and Garber, $232,000 (completed). Replacing trestle approaches to Bridge 146 with steel viaduct and fill bridge ends, Myrtle, Ark., $100,000 (20 per cent completed). Construction of Continental elevator, capacity 2,500,000 bu., Kansas City, Mo., $1,831,000 (completed). Rearrangement of tracks and construction of icing facilities, Chevrolet yard, Leeds, Mo., $106,500 (completed). Addition to Kansas-Missouri elevator, capacity 2,250,000 bu., Kansas City, Mo., $833,000 (completed). Replacing timber pile piers at Bridge 251 with concrete pile piers, Louisville, Neb., $124,000 (completed). Reduction of grades at various points, 14.44 miles, Gypsum City, Kan., to Hoisington $1,056,800 (completed). Reduction of grades at various points, 24.53 miles, Osawatomie, Kan., to Council Grove, $2,727,000 (completed). Grade revision at various points, 27.28 miles, Delavan, Kan., to west line of Dickinson county, $2,162,175 (completed). Grade revision at various points, 1.81 miles, west line of Dickinson county, to Gypsum City, Kan., $109,645 (completed).
Reconstruction of Bridge 637, Arkadelphia, Ark., $165,700 (completed). Renewing Bridge 85, Medina, Ark., $148,000 (completed).

Monongahela

Second Track: Isabella, Pa., to Huron, 5.25 miles.

Montana Power Company

First Track: Pablo, Mont., to a point on the Flathead river, 9 miles.

Montour

Important Work Undertaken: Revision of alinement, 5,010 ft. to eliminate heavy curvature, Coraopolis, Pa. (completed).

New York Central

First Track: (Pittsburgh & Lake Erie). Monaca, Pa., to Josephtown, 3.013 miles.

Second Track: (Cleveland, Cincinnati, Chicago & St. Louis). Terre Haute, Ind., to Sanford, 7.5 miles.

Important Work Undertaken: Improvement of ventilating system, express and suburban levels, Grand Central Terminal, New York, $236,000 (70 per cent completed). Hotel Waldorf-Astoria, between Park and Lexington avenues and 49th and 50th streets, New York (completed). Additional electric power installation for Hotel Waldorf-Astoria, New York, $177,000 (completed). Miscellaneous terminal facilities, account substructural work, Hotel Waldorf-Astoria, Grand Central Terminal, New York. $150,000 (completed).

Strengthening retaining wall at 138th street, New York, $100,000 (75 per cent completed). Undercrossing at 233rd street, New York, $349,000 (75 per cent completed). Foundations for St. John's Park freight terminal Charlton to Clarkson streets, New York, $2,550,000 (80 per cent completed). Elevated track structure, Clarkson street to 30th street, New York, $3,236,000 (10 per cent completed). Cudahy building and elevated track structure, 14th street, New York, $700,000 (10 per cent completed). Foundations for loop-track structure at 30th street yard, New York, $695,000 (40 per cent completed). Alterations to piers and construction of new bulkhead, Piers B to F, 60th-Street yard, New York, $800,000 (50 per cent completed). Construction of city sewer west of Riverside drive, 72nd street, New York, $220,000 (75 per cent completed). Relocation of city sewers from 33rd to 59th streets, $1,000,000 (15 per cent completed). Warehouse and cold storage building, 802-16 Washington street, New York, $500,000 (10 per cent completed). City express highway covering tracks, city structure No. 4, city bears cost, $3,175,000 (20 per cent completed). City express highway, structure No. 2, railway constructs at expense of city, New York, $3,100,000 (completed).

Freight house and team yard, Newark avenue, Jersey City, N. J., $140,000 (completed). New substations and new circuit-breaker houses, West Side electrification, Spuyten Duyvil, N. Y., to Croton, $290,000 (95 per cent completed). New substations and new circuit-breaker houses Spuyten Duyvil to 60th street, New York, West Side electrification, $3,076,000 (90 per cent completed). Freight locomotive inspection shed and track work at Harmon, N. Y.; third rail and cables, 138th street, New York to Croton, N. Y., electrification of 30th-street branch, $430,000 (20 per cent completed). Underground duct line Botanical Garden to Williamsbridge, N. Y., $249,000 (completed). Extension to electrical shops, Harmon, N. Y., $2,685,000 (completed). Mercury-arc rectifier, 3,000 kw. capacity, Substation 7-A, Wakefield, N. Y., $110,000 (completed).

Elimination of grade crossing, Buckhout's crossing, Briarcliff Manor, N. Y., $201,000 (completed). Fenders on freight and passenger bridges, Albany, N. Y., $151,000 (82 per cent completed). Additional track pans, tracks 3 and 4, Rome, N. Y., $420,000 (98 per cent completed). Elimination of grade crossing, Plank road, Central Square, N. Y., $156,100 (completed). Grade separation, Union Square highway, Maple View, N. Y., $103,800 (completed). Grade separation, Purdy's crossing, Purdy, N. Y., $150,100 (completed). Grade separation, West Schuyler street, Utica, N. Y., $120,050 (completed). Grade separation, Culver avenue, South Utica, N. Y., $112,900 (completed). Elimination of grade crossing, Morris road and State Highway 5209, Harbor, N. Y., $157,700 (completed). Elimination of Colosse crossing at grade, Mapleview, N. Y., $141,800 (completed). Reconstruction of bridge No. 431, Fort Plain, N. Y., $105,600 (completed).

Elimination of crossing at grade, Cemetery road, Canton, N. Y., $107,900 (completed). Land and grading for Peat Street yard, Syracuse, N. Y., $653,007 (completed). Reconstruction of Bridge 594, East Syracuse, N. Y., $230,300 (75 per cent completed). Grade separation, Thompson road, Syracuse, N. Y., $665,600 (completed). Grade separation, Midler avenue, Syracuse, N. Y., $207,332 (completed). Grade separation, Genesee street, Bowmansville, N. Y., $288,700 (completed). Grade separation, Wende road, Wende, N. Y., $118,500 (completed). Grade separation, Main street, Savannah, N. Y., $243,400 (completed). Reconstruction of Bridge 0-150, Charlotte, N. Y., $171,000 (completed). Reconstruction of Bridge F-156, Knowlesville, N. Y., $139,350 (completed). Additional team tracks and concrete driveways, Rochester, N. Y., $195,000 (completed).

Grade separation, Albrion street, Holley, N. Y., $163,700 (95 per cent completed). Elimination of grade crossings, Amherst to Austin streets, Black Rock, Buffalo, N. Y., $1,559,200 (75 per cent completed). Reconstruction of Bridge L-266, Lackawanna, N. Y., $407,400 (completed). Grade separation, Lynch's road, Junius, N. Y., $114,500 (completed). Grade separation, state highway No. 5334-A, Reading Center, N. Y., $109,700 (10 per cent completed).

Four track subway for relocated highway, Gowanda road, Athol Springs, N. Y., $276,000 (completed). Grade separation, Asbury Chapel road, Swanville, Pa., $176,000 (completed). Overhead highway bridge, Telegraph road, Elyria, Ohio (50 per cent completed). Grade separation, Monroe street, Toledo, Ohio, $480,000 (completed). Grade separation, West Central avenue, Richards, Ohio, $275,000 (completed). Extension of track elevation to eliminate grade crossings at Division, Cherry and Walnut streets, South Bend, Ind., $859,000 (3 per cent completed). Replacing gantry crane, Chicago (completed). Grade separation, state highway No. 2, North Hayden, Ind., (completed). Replacing temporary bridges with permanent structures, Springwells and Lawndale avenues, grade separation, Detroit, Mich., $125,000 (completed). Water-treating plants, Huron, Ohio, Air Line Jct., Stryker, Mina, Elkhart, Ind., (2), Chesterton, $487,000 (completed). Additions and repairs to fenders, piers at Bridge 187.11 over Illinois river, De Pue, Ill. (completed).

(Ohio Central Lines). Additional unit, northbound yard, including car retarders, Stanley yard, Toledo, Ohio, $1,432,000 (completed).

(Michigan Central). Widen subway at Dougal road, grade separation, Windsor, Ont., $105,000 (completed). Separation of grades, Miller road, Dearborn, Mich., $267,424 (completed). Replacing temporary bridges with permanent structures, Springwells and Lawndale avenues, grade separation, Detroit, Mich., $120,725 (completed). Replacing temporary structures with permanent bridges, grade separation at 23rd and 24th streets, Detroit, Mich., $146,462 (completed).

(Cleveland, Cincinnati, Chicago & St. Louis). Revision of alinement, construction of engine terminal, separation of grades and electrification of terminal for westerly approach to Cleveland Union Terminal, Cleveland, Ohio, to Berea, $6,750,000 (completed). Grade separations at three streets, Carthage, Cincinnati, Ohio, $1,357,000 (5 per cent completed). Grade separation, state highway and traction line, Glen Echo, Ohio, $165,000 (completed). Renewal and extension of bridge No. 227, Bonnell, Ind., $185,000 (completed).

(Indiana Harbor Belt). Separation of grades with other railways and with highways, Bellewood, Ill., I. H. B. proportion, $696,792 (completed). Separation of grades, Burnham avenue, Calumet City, Ill., I. H. B. proportion, $198,000 (completed). Grade separation, Ogden avenue, La Grange, Ill., I. H. B. proportion, $152,000 (85 per cent completed).

(Pittsburgh & Lake Erie). Facilities for transferring freight between rail and river, Colona, Pa., $359,000 (completed).

New York, Chicago & St. Louis

Important Work Undertaken: Realinement of main track and renewal of bridge, Angola, N. Y., $170,000 (completed). Renewal of four bridges and filling of approaches, Coffeen, Ill., $543,000 (completed). Grade separation and east approach to union station, Cleveland and East Cleveland, Ohio, $19,000,000 (completed). Change of alinement, grade separation and construction of new yard, Toledo, Ohio, to Maumee, $1,299,150 (25 per cent completed).

New York, New Haven & Hartford

Important Work Undertaken: Elimination of grade crossing, 238th Street viaduct, Woodlawn, N. Y., $817,700, N. Y.. N. H. & H. share, $165,104 (completed). Elimination of grade crossing, 241st Street viaduct, Woodlawn, N. Y., $693,306, N. Y., N. H. & H. share, $135,200 (completed). One-story brick warehouse, tracks and driveway, Harlem river, New York City, $259,300 (completed). Construction of three-span, four-track concrete bridge to replace pile trestle over West river, New Haven, Conn., $175,000 (completed). Extension of transfer agent's office and installation of pneumatic-tube dispatch service, Cedar Hill yard, New Haven, Conn., $100,000 (completed).

Elimination of grade crossings at four streets, Hartford, Conn., N. Y., N. H. & H. proportion, $837,000 (started). Elimination of Water Street grade crossing, Quincy, Mass., N. Y., N. H. & H. proportion, $705,800 (20 per cent completed). Elimination of grade crossings, Westwood, Mass., $180,000, N. Y., N. H. & H. proportion, $50,000 (completed). Widening overhead street bridge, Boston, Mass., $174,000, N. Y., N. H. & H. proportion, $38,500 (completed). Alteration of overhead bridge, Attleboro, Mass., $165,000, N. Y., N. H. & H. share, $42,240 (completed).

(Boston Terminal Company). Alterations to station basement, South Boston, Mass., $170,000 (10 per cent completed). Reconstruction of train shed, South Station, Boston, Mass., $1,800,000 (completed).

Norfolk & Western

First Track: Devon, W. Va., on the West Virginia-Kentucky state line to the West Virginia-Virginia state line, 7.56 miles. West Virginia-Kentucky state line to the Kentucky-Virginia state line, 5.66 miles. Kentucky-Virginia state line to Grundy, Va., and from the West Virginia-Virginia state line to Bishop, Va., 33.20 miles.

Important Work Undertaken: Elimination of grade crossings, Columbus, Ohio, $4,500,000 (completed). Extension of two warehouses, Lambert's Point, Va., $255,000 (completed). Extension of Pier S, Lambert's Point, Va., $550,000 (completed). Construction of general office, Roanoke, Va., $700,000 (completed). Construction of passenger station, tracks and incidental facilities, Portsmouth, Ohio, $1,190,000 (completed). Reconstruction of three bridges, Shenandoah division, $483,500 (completed). Grade separations, Nottaway, Va., Columbus, Ohio and Circleville, $127,000 (50 per cent completed). Bridge improvements, North Carolina extension, $755,000 (75 per cent completed). Extension to Hotel Roanoke, Roanoke, Va., $240,000 (completed). Additional tracks and bridges, Loney's curve to Devon, W. Va., $550,000 (completed).

(Big Sandy & Cumberland). Reconstruction of 25 miles of narrow-gage line, converting it to standard gage, Devon, W. Va., to Hurley, and Grundy, Va., down the Levisa river; also construction of 14 miles of standard-gage cut off from Hurley to Levisa river, $8,000,000 (completed).

(Guyandot & Tug River). Construction of 10.5 miles of new road, Newhall, W. Va., to West Virginia-Virginia state line, thence up Horsepen creek about 2 miles, including a wye connection at Rift, W. Va., $1,240,000 (completed).

Northern Pacific

Important Work Undertaken: Grade separation, Minneapolis, Minn., $300,000 (completed). Bridge over west waterway, Duwomish river, Seattle, Wash., $324,000 (5 per cent completed).

Pennsylvania

Important Work Undertaken: Grade separation, Bloomsdale road, Bristol, Pa., $312,600 (completed). Grade separation, state highway Route S-41, including reconstruction of bridge over Pensuaken creek, Palmyra, N. J., $225,000 (completed). Rearrangement of tracks, Pennsylvania terminal, necessitated by extension of post office building, New York, $600,000 (completed). Construction of bascule-lift bridge to carry Brunswick turnpike over Baker's Basin, D. & R. canal, Lawrence, N. J., $200,000 (completed). Extension of Haynes Avenue viaduct over Waverly yard, Newark, N. J., Pennsylvania proportion, $100,000 (completed).

New passenger station, two additional tracks through Newark and three lift bridges over Passaic river, Newark, N. J., $15,000,000 (8 per cent completed). Replacement of five steel and wooden transfer bridges destroyed by fire, Greenville, N. J., $750,000 (completed). Replacement of superstructure, Bridge 31.32 over George street, New Brunswick, N. J., $151,770 (completed). Replacement of superstructure, Bridge 31.43 over French street, New Brunswick, N. J., $228,500 (completed). Replacement of superstructure Bridge 31.49 over Schuyler street, New Brunswick, N. J., $124,600 (completed).

Electrification of main line New York to Manhattan Transfer, $8,230,000 (completed). Electrification of main line, Jersey City, N. J., to New Brunswick, $10,720,000 (85 per cent completed). Electrification of main line, New Brunswick, N. J., to Trenton, $6,500,000 (16 per cent completed). Electrification of freight tracks, Greenville, N. J., Waverly, Passaic, Harsimus and Meadows, and South Amboy branch, $8,626,000 (10 per cent completed). Through power supply, Trenton, N. J., to Liddonfield, Pa., $956,000 (10 per cent completed).

Reconstruction of overhead bridge, Coatesville, Pa., $170,000 (completed). Reconstruction of overhead bridge at Lititz Pike, Lancaster, Pa., $215,000 (completed). Construction of overhead bridge, Dewart, Pa., $225,000 (completed). Construction of undergrade bridge, Schuylkill Haven, Pa., $125,000 (completed). Cattlepen building, 36th street and Gray's Ferry avenue, Philadelphia, Pa., $1,530,000 (completed). Construction of undergrade bridge, Swarthmore, Pa., $300,000 (completed). Construction of B-Street undergrade bridges, Philadelphia, Pa., $395,000 (completed). Construction of overhead bridge south of Sunbury, Pa., $300,000 (completed). Relocation of tracks to eliminate two grade crossings, Liverpool, Pa., $260,000 (50 per cent completed). Construction of undergrade bridge Cockeysville, Md., $365,000 (completed). Perishable-freight facilities, Baltimore, Md., $710,000 (completed). Construction of overhead bridge, Bare Hills Md., $190,000 (completed).

Construction of overhead bridge, Parkton, Md., $160,000 (completed). Removal of tracks from Seventh street, Camden, N. J., $720,000 (10 per cent completed). Construction of overhead bridge and pedestrian tunnel, Severn, Md., $115,000 (completed). Construction of undergrade bridge, Middle River, Md., $150,000 (completed). Continuation of work in connection with the new terminals for through and suburban trains, rearrange-

ment of yards and engine terminals, new central power plant and new office building above suburban station, Philadelphia, Pa., $60,000,000 (80 per cent completed). Work in connection with new main line, Baltimore improvements, Baltimore, Md., $15,000,000 (10 per cent completed). Electrification of main line, Wilmington, Del., to Washington, D. C., $38,485,000 (15 per cent completed). Through power supply, Liddonfield, Pa., to Wilmington, Del., $8,068,000 (10 per cent completed).

Addition to grain elevator, Erie, Pa., $315,000 (completed). Relocation of tracks and bridges in connection with Allegheny boulevard, Brilliant, Pa., $223,000 (completed). Construction of overhead bridge and relocation of state highway to eliminate four grade crossings, Waltersburg, Pa., $154,000 (completed). Extension of two ash pits and installation of a 110-ft. turntable, South Oil City, Pa., $156,000 (completed). Grade separation, Athol Springs, N. Y., Pennsylvania proportion, $221,500 (completed). Grade separation, Portageville, N. Y., $157,000 (completed). Construction of overhead bridge and a lateral highway to eliminate three grade crossings, between Panama, N. Y., and Sherman, $120,000 (50 per cent completed). Reconstruction of overhead bridge, Ridge road, Lackawanna, N. Y., Pennsylvania proportion, $100,000 (completed). Reconstruction of Bridge 22.70 over Big Sister creek, Angola, N. Y., Pennsylvania proportion, $175,000 (completed).

Grade separation, Main street, Weirton, W. Va., $359,200 (completed). Replacement of Bridge 0.98 carrying state highway, Glen, Pa., $188,600 (completed). Grade separation, Pilling street, Newcomerstown, Ohio, $142,200 (completed). Grade separation, street subway and two foot subways, Crafton, Pa., $450,700 (completed). Reconstruction of Bridge 44.10 over state highway, Steubenville, Ohio, $272,400 (completed). Reconstruction of bridges over Main and Steuben streets, Pittsburgh, Pa., $403,200 (10 per cent completed). Rail to river transfer facilities, Baden Pa., $354,200 (10 per cent completed—work deferred). Grade separation, Harrison avenue, Canton, Ohio, $152,700 (completed). Grade separation, Trenton street, Toronto, Ohio, $191,700 (completed). Grade separation, Eleventh street, Pittsburgh, Pa., $184,500 (completed). Grade separation, Centerburg, Ohio, $208,000 (completed). Relocation of state highway to eliminate grade crossing, Coal Ridge, Ohio, $106,300 (completed). Reconstruction of Trestle 2.42, Pittsburgh, Pa., $300,000 (30 per cent completed).

Track elevation and construction of second track, Englewood Connecting Railway, 2.34 miles, Chicago, $2,500,000, (40 per cent completed). Grade separation with other roads, Fifteenth place and Stewart avenue, Chicago, Pennsylvania proportion, $1,396,400 (completed). Track elevation, Sixty-Ninth to Eighty-Seventh streets, Chicago, $100,000 (completed). Track elevation between Dutoit and Bainbridge streets, Dayton, Ohio, $715,000 (completed). Replacement of double-track pile trestle over Kankakee river with eight 60-ft. deck plate-girder spans, English Lake, Ind., $280,000 (completed). Auxiliary yard for Detroit Union Produce Terminal, Detroit, Mich., $115,000 (completed). Dredging to increase depth of water in east mooring basin, coal dock, Sandusky, Ohio, $102,000 (completed). Relocation of line and track elevation (Dayton Union Railway), Dayton, Ohio, $3,500,000 (85 per cent completed).

(Columbus Depot Company). Construction of trainshed and alterations to union station, Columbus, Ohio, $734,000 (completed).

Pere Marquette

Important Work Undertaken: Reconstruction of south ferry slip, Ludington, Mich., $170,000 (completed). Construction of single-leaf bascule span to replace swing span over Black river, Port Huron, Mich., $320,000 (completed). Grade separation with Michigan Central and Southern avenue, Detroit, Mich., $235,000 (completed). Grade separation, Oakman boulevard, Detroit, Mich., Pere Marquette proportion, $218,000 (completed). Grade separation Ford road, Detroit, Mich., Pere Marquette proportion, $186,000 (completed).

Pittsburgh & West Virginia

First Track: Pierce, Pa., to Connellsville, 39.85 miles. Sudan, Pa., to Donora, 5.9 miles.

Port of New York Authority

Important Work Undertaken: Construction of a union inland l.c.l. freight station to serve all roads entering New York, between Eighth and Ninth avenues and Fifteenth and Sixteenth streets, New York, $16,000,000 (10 per cent completed).

Quanah, Acme & Pacific

First Track: Quanah, Tex., to Acme, 6 miles.

Reading

First Track: Bickell colliery, Pa., to Doutyville, 4.79 miles.

New Lines Projected: From Pennsylvania avenue subway to Ninth street elevated, Philadelphia, Pa., 0.22 mile. Pennsylvania avenue subway to Baltimore & Ohio tunnel, Philadelphia, Pa., 0.13 mile.

Important Work Undertaken: Twelve-story terminal commerce building, Philadelphia, Pa., $4,680,000 (completed). Grade separation with new street, Olney avenue, Olney, Philadelphia, Pa., $140,000 (completed). Replacement of Bridge 1, Rising Sun avenue and Bristol street, Olney, Philadelphia, Pa., Reading proportion, $130,000 (completed). Grade separations Valley Green and Mill roads, Camp Hill, Pa., $107,000 (completed). Grade separation at three crossings, Penllyn, Pa., $105,000 (completed). New passenger and freight stations and incidental facilities, Royersford, Pa., $127,500 (85 per cent completed). Replacing timber tunnel lining with brick and concrete, Dillinger, Pa., $240,000 (completed). Construction of double-deck pier house and extension of wharf, Pier B, Philadelphia, Pa., $700,000 (completed). Remodeling and equipping old shop as frog-repair shop and a motor-car repair shop, Reading, Pa., $195,000 (completed). Installing car wheel shop in old paint shop, Reading, Pa., $160,000 (completed). Grade separation and construction of new passenger and freight facilities, Norristown, Pa., $1,003,000 (15 per cent completed).

Reconstruction of Bridges 4-18 and 4-65 east of Sinking Springs, Pa., $112,500 (5 per cent completed). Changes in station facilities to accommodate the opening of Windrim avenue, also provision for parking space, Wayne Junction, Pa., $100,000 (completed). Grade separation, Black Horse Pike, Folsom, N. J., $110,000 (completed). Reconstruction of Bridge 5-72 over East Logan street and construction of pedestrian tunnel, Fishers, Pa., $100,000 (35 per cent completed). Construction of Bridge 0-09, state highway Route 290, St. Nicholas, Pa., $225,000 (completed). Grade separation, Wissahickon creek to Fountain street, Manayunk, Pa., $4,500,000 (completed). New stone passenger station on west side of road, waiting room on east side, platforms, shelters, etc., Jenkintown, Pa., $116,000 (80 per cent completed).

Electrification of Philadelphia suburban lines, approximate cost $21,500,000, which includes the following items of work in progress: Abolition of grade crossings, Chestnut Hill branch, $3,700,000 (30 per cent completed); new electric car shop and equipment, including yard tracks, Wayne Junction, Pa., $600,000 (completed). Also electrification structures, wiring and substations: Reading terminal to Wayne Junction, $743,000 (completed); Wayne Junction to Lansdale, $1,476,000 (completed); Glenside to Hatboro, $170,000 (completed); Lansdale to Doylestown, $193,000 (completed); Jenkintown to Langhorne, $1,000,000 (completed); multiple-unit cars, $3,500,000 (completed); signal installations on same lines, $3,023,000 (completed). Removing top of Gwynedd tunnel and constructing bridge over open cut, $135,000 (completed). New station and platforms, Chestnut Hill, Pa., $330,000 (85 per cent completed). Reconstruction of Bridge 11-95, Old York road, Noble, Pa., $185,000 (completed). Electrification, Langhorne, Pa., to West Trenton, N. J., including structures, wiring, color-light signals, etc., $1,000,000 (completed). Electrification structures, Wayne Junction to Chestnut Hill, including color-light signals, $500,000 (15 per cent completed).

St. Louis-San Francisco

Important Work Undertaken: Construction of union station, joint with Chicago, Rock Island & Pacific, including relocation and reconstruction of tracks, Oklahoma City, Okla., $2,500,000 (completed). Grade separation, Henderson street, Ft. Worth, Tex., $491,100 (completed). Grade separation, Southwest avenue, St. Louis, Mo., $123,800 (completed).

San Luis Valley Southern

Line Under Survey: Jaroso, Col., to Questa, N. M., 18.5 miles.

Savannah & Atlanta

Important Work Undertaken: Grading to widen roadbed to standard dimensions, $100,000 (completed).

Seaboard Air Line

Important Work Undertaken: Construction of steel viaduct over Appomattox river, including the filling of approaches 3,000 ft. long, trackwork and incidental grading, Petersburg, Va., $400,100 (completed).

Southern

Second Track: Williamstown, Ky., to Rogers Gap, 22 miles.

Important Work Undertaken: Reconstruction of portion of bridge over Savannah river, Augusta, Ga., $250,000 (completed). Reconstruction of bridge over Cumberland river, Burnside, Ky., $238,000 (completed). Grade separation at four streets, Birmingham, Ala., $738,000 (90 per cent completed).

Southern Pacific

Third Track: (Pacific Lines). Los Angeles yard, 0.67 mile.

Fourth Track: (Pacific Lines). Los Angeles yard, 0.68 mile.

Important Work Undertaken: (Pacific Lines). Reinforcing steel viaduct over Los Alamos creek, Narlon, Cal., $105,000 (80 per cent completed). Reinforced-concrete freight house, office building, transfer platform, automobile platform, and track facilities, Reno, Nev., $156,000 (completed). Extension of freight house and conversion into hospital; extension of warehouse and conversion into kitchen and commissary annex, Tucson, Ariz., $175,000 (completed). Renewal of deep-water section of approach to Dumbarton drawbridge and construct 1,750 ft. of creosoted ballast deck trestle, Dumbarton, Cal., $138,300 (90 per cent completed).

Construction of rock-filled dam 440 ft. long and 90 ft. high across Bonito creek, N. M., to provide for additional water storage of 332,000,000 gal., $540,000 (completed). Reinforced-concrete, brick and frame hospital, 5-story addition to general hospital, San Francisco, Cal., $511,000 (completed). Revision of alinement about 6 miles, and construction of new yard and passenger station, San Jose, Cal., $3,279,000 (15 per cent completed). Construction of 18,582 ft. of new line to reduce curvature, Mt. Shasta-Black Butte, Cal., $319,000 (completed). Filling of 10.76 acres of low land along Los Angeles river and construction of rip rap bulkhead, to increase available acreage in Taylor yard, Los Angeles, Cal., $102,000 (80 per cent completed). Double-track connection, 2,600 ft. long, with Union Pacific, Los Angeles, Cal., $433,000 (completed). Raising Atchison, Topeka & Santa Fe bridge over the east side of the Los Angeles river 10 ft. and construction of a structure below to provide for separation of grades, Los Angeles, Cal., $121,000 (completed).

Steel and concrete subway, Seventh street, Oakland, Cal., $125,000 (completed). Subway at Park avenue, 600 ft. long, San Jose, Cal. (completed). Subway to separate grades at the Alemeda, San Jose, Cal., grade separation, county highway, Chittenden, Cal. (completed). Grade separation, county road, Forest Lake, Cal. (completed).

(Texas and Louisiana lines). Drawbridge and additional trackage, Harvey canal, Harvey, La., $325,000 (5 per cent completed). Construction of tracks to serve industrial development near Navigation boulevard, Houston, Tex., $106,000 (completed). Produce Terminal warehouse, New Orleans, La., $453,000 (65 per cent completed—work deferred temporarily). New passenger station, tracks and other facilities, Houston, Tex., $3,600,000 (30 per cent completed). Construction of extension to Lockport branch, 4.95 miles to serve Valentine refinery, Lockport, La., $110,000 (completed). Construction of 7-mile extension to reach Ashland refinery, Ashland, La., $240,700 (62 per cent completed—work deferred).

Spokane, Portland & Seattle

First Track: (Oregon Electric). Sweet Home to east line of sec. 1 T. 15 S. R. 1 E., Willamette Meridian, 3.17 miles.

Important Work Undertaken: Reconstruction of bridges at various points, $100,000 (completed).

(Oregon Electric). Construction of new lines, Lebanon, Ore., to Sweet Home and Sweet Home to Calapooya river, 30.17 miles (27 miles in operation in 1930), $12,200,000 (completed).

State Belt Railroad

Important Work Undertaken: Construction of combination railway, street car and highway bridge over Channel street at Third street, San Francisco, Cal., $600,000 (20 per cent completed).

Tennessee, Alabama & Georgia

Important Work Undertaken: Reconstruction and strengthening of all main-line bridges; widening embankments and cuts; general rehabilitation of roadbed and track, Chattanooga, Tenn., to Gadsen, Ala., 92 miles, $500,000 (to be completed in 1932).

Terminal Railroad Association of St. Louis

Important Work Undertaken: Eight-story reinforced-concrete warehouse and mart with 13-story tower, St. Louis, Mo., $3,000,000 (completed). North approach to Municipal bridge, combination embankment, reinforced-concrete bridges and steel viaduct, 7,130 ft. long, East St. Louis, Ill., $1,720,000 (40 per cent completed).

Texas & Pacific

Second Track: Union Terminal Junction, Dallas, Tex., to Browden, 1.3 miles.

Important Work Undertaken: Double-track bridge over Trinity river floodway, 2,100 ft. long, Dallas, Tex., $700,000 (completed). Replacing two piers and construction of an additional 300-ft. span over Old river, Torras, La., $325,000 (completed). Grade separation, Henderson street, Ft. Worth, Tex., $400,000 (completed). Grade separation, Jennings avenue, Ft. Worth, Tex., $375,000 (completed). Grade separation, Main street, Ft. Worth, Tex., $300,000 (completed). Twelve-story brick and steel passenger station and office, Ft. Worth, Tex., $1,500,000 (completed). Eight-story inbound freight house and storage warehouse, Ft. Worth, Tex., $1,800,000 (completed). One-story concrete and steel outbound freight house, Ft. Worth, Tex., $115,000 (completed). Coach yard facilities, including shop, storehouse, tracks, etc., Ft. Worth, Tex., $140,000 (completed).

Toledo, Angola & Western

Important Work Undertaken: Grade separation, public highway, Toledo, Ohio, $250,000, T. A. & W. proportion, $60,000 (completed).

Tulsa Union Depot

Important Work Undertaken: Construction of union station, additional tracks and reconstruction and relocation of existing tracks, revision of grade and elimination of grade crossings at four streets, Tulsa, Okla., $2,500,000, construction handled by St. Louis-San Francisco (completed).

Unadilla Valley

Important Work Undertaken: Commercial crushed stone plant and sand and gravel washery, New Berlin, N. Y., $250,000 (completed).

Union Pacific

First Track: Corlett Jct., Wyo., to Cheyenne, 3.17 miles.

(Los Angeles & Salt Lake) Boulder Jct., Nev., to Bounder City, 22.69 miles.

Important Work Undertaken: New union passenger station and incidental facilities, Omaha, Neb., $3,900,000 (completed). Overhead viaduct 826 ft. long, including track changes, Twenty-Seventh street and Ed. Creighton avenue, Omaha, Neb., U. P. proportion, $163,600 (completed). Reconstruction Eleventh-Street viaduct, Omaha, Neb. (completed). Grade-separation viaduct at Thirty-Third avenue, to serve Lincoln and Meridian highway, and construct 10,187 lin. ft. of side track, Columbus, Neb., $230,000 (completed). Grade separation Garfield street, Grand Island, Neb. (completed).

Addition to yard and additional yard facilities; construction of bridge for 17 tracks over Crow creek, Cheyenne, Wyo., $1,250,000 (completed). Twenty-stall enginehouse and rearrangement of tracks, Cheyenne, Wyo., $250,000 (completed). Improvements to tie plant and equipment, Laramie, Wyo., $100,000 (completed). New coaling and engine sanding facilities, Marysville, Kan., $144,000 (completed).

(Oregon Short Line). Combination warehouse, mill and elevator, Salt Lake City, Utah, $225,000 (completed).

(Oregon-Washington Railroad & Navigation Company). Construction of 3,409 ft. of new line, including a 550-ft. concrete-lined double-track tunnel and approaches, Chatfield, Ore., $185,700 (completed).

(Los Angeles & Salt Lake). Enlargement of tunnel No. 4 to standard double-track section and lining with reinforced concrete, Kyle, Nev., $502,500 (60 per cent completed). Construction of reinforced-concrete viaduct, 3,173 ft. long, spanning Los Angeles river and Atchison, Topeka & Santa Fe and L. A. & S. L. tracks, to abolish grade crossing, Los Angeles, Cal., L. A. & S. L. proportion, $520,300 (50 per cent completed). Reinforced concrete viaduct spanning Los Angeles river and A. T. & S. F. and L. A. & S. L. tracks, to abolish grade crossing, Fourth street, Los Angeles, Cal., L. A. & S. L. proportion, $395,000 (completed). Overland Terminal warehouse, Ninth and Alameda streets, Los Angeles, Cal., $800,000 (completed). Main leads to serve pier, dock and wharf development Long Beach, Cal., $136,000 (completed). Grade separation, Spence street and Washington boulevard, San Pedro branch, Hobart, Los Angeles, Cal., $142,000 (70 per cent completed). Installation of generator and incidental equipment, power plant, Las Vegas, Nev., $115,000 (completed).

Union Railway of Memphis

Important Work Undertaken: Grade separation, concrete viaduct, Summer avenue, Memphis, Tenn., $300,000, U. Ry. proportion, $75,000 (90 per cent completed).

Virginian

First Track: Vaco Junction, W. Va., to D. B. Tower, 0.93 mile. Baileysville, W. Va., to M. P. 33, 7 miles.

New Road Under Construction: From M. P. 33 to Gilbert, W. Va., 11.4 miles.

Important Work Undertaken: Replacing timber trestles with permanent structures and strengthening steel bridges at various points, $104,000 (completed).

Wabash

Important Work Undertaken: Grade separation, Allen road and Outer drive, Oakwood, Mich., $296,790 (completed). Grade separation, Union and Lindell avenue, St. Louis, Mo., $299,000 (completed). Grade separation, South Grand avenue, Springfield, Ill., $133,535 (completed). Grade separation, Woodsdale, Glendale and Detroit avenues, Toledo, Ohio, $320,268 (completed). Annex to hold 1,000,000 bu., grain elevator, Kansas City, Mo., $236,368 (completed). Reconstruction of bridge No. 499, Brunswick, Mo., $148,345. Construction of new bridge over Missouri river, St. Charles, Mo., $5,500,000 (16 per cent completed).

Western Maryland

New Line Under Construction: At Cheat Junction, W. Va., 1.09 miles.

Western Pacific

First Track: Keddie, Cal., to Bieber, 111.86 miles, $9,800,000 (open for freight traffic, 98 per cent completed).

Yankton, Norfolk & Southern

New Line Under Survey: Yankton, S. D., to Pierce, Neb., 53 miles.

Railway Construction in Canada

Canadian National

First Track: Lake Verde, P.E.I., to Pisquid, 5 miles. Sunny Brae, N. S., to Guysborough, 2 miles.

Mawer, Sask., southwesterly, 5.96 miles. Neidpath, Sask., to Swift Current, 21.14 miles. Ridgedale, Sask., easterly 15 miles. Unity, Sask., southwesterly, 24 miles.

Alliance, Alta., southeasterly 0.86 mile. Unity, Alta., southwesterly 2.30 miles. On Lulu Island, B. C., 12.30 miles.

Second Track: Ft. William, Ont., to Neebing, 3.15 miles.

(Oshawa Railway). At Oshawa, Ont., 0.17 mile.

Important Work Undertaken: Storage and lead tracks to Pier B, Halifax, N. S. (to be completed in 1932). New Hotel, Charlottetown, P.E.I. (completed). Passenger station, St. John, N. B. (to be completed in 1932). Renewing trestle across Courtney bay, St. John, N. B. (completed). Grade separation, La Canardiere road, Limoilou, Que. (completed). Rebuilding station destroyed by fire, Levis, Que. (completed). Replacement of bridge over Becancour river, Sorel subdivision, P. Q. (completed). Six-story warehouse, Montreal, Que. (completed).

Extension to Chateau Laurier, Ottawa, Ont. (completed). Grade separation, Simcoe street, Oshawa, Ont. (completed). Grade separation, west subway, St. Clair avenue and Brampton subdivision, Toronto, Ont. (to be completed in 1932). Revision of alinement and grade separation, west subway, St. Clair avenue and Newmarket subdivision, Toronto, Ont. (to be completed in 1932). Construction of passenger station, Hamilton, Ont. (completed). Grade separation between Austin and Amherst streets, joint with other railways, Black Rock, Buffalo, N. Y. (to be completed in 1932). Grade separation, West street, Brantford, Ont. (completed). Grade separation and construction of new station, London, Ont. (to be completed in 1932).

Reconstruction of trestle over Canadian Pacific and construction of a connecting line with the Algoma Eastern, Mile 1.91, Sudbury subdivision, P. Ont. (completed). Wharf and freight shed, Port Arthur, Ont. (to be completed in 1932). Construction of freight shed to replace one destroyed by fire, Mission, Man. (completed). Pedestrian and vehicular subway, Pembina highway, Winnipeg, Man. (completed). Construction of cut-off line for freight service, Regina, Sask. (to be completed in 1932). New 260-room hotel, Saskatoon, Sask. (to be completed in 1932). Reconstruction of Taunton Creek bridge, Brazeau subdivision, Calgary division, P. Alta. (completed). Construction of sewer, False Creek area, Vancouver, B. C. (started). Reconstruction of steamship pier to replace old dock destroyed by fire, Vancouver, B. C. (completed). New hotel, 595 rooms capacity, Vancouver, B. C. (to be completed in 1932).

Canadian Pacific

First Track: Asquith, Sask., to Cloan, 14.1 miles. Crossfield, Alta., northwesterly, 28 miles. Dunelm, Sask., southwesterly, 25.2 miles (track completed but not in operation). Fife Lake, Sask., westerly, 25.5 miles, Hamlin, Sask., to Shellbrook, 26.6 miles (grading 90 per cent completed and track laying started).

Milstead, Sask., northeasterly, 36 miles (grading 92 per cent completed and one mile of track laid). Prince Albert, Sask., to Lac la Biche, 94 miles (grading completed and 81.7 miles of track laid). Rosetown, Sask., southeasterly 17.6 miles (grading completed and 16.5 miles of track laid). Savona, B. C., to Spences Bridge, 16.9 miles, to revise grades, 4.8 miles raised only (completed). Bulwark, Alta., to Berkinshaw, 14.5 miles. Skaha, B. C., to Okanagan Falls, 85 miles. Tuffnell, Sask., to Prince Albert, 71.6 miles (grading completed and 69.1 miles of track laid). Wolfe's Cove branch, P. Q., 1.5 miles. Vanguard, Sask., to Meyronne, 31.5 miles (grading completed and track laid).

(Lacombe & Northwestern). Alta, 20.5 miles.

Important Work Undertaken: Grade reduction, Estavan, Sask., to Forward, 6.14 miles (completed). Grade revision, Savona, B. C., to Spences Bridge, 16.9 miles (completed). Strengthening bridges and replacing turntable at Brownville, Jct., Mattawamkeag and Moosehead subdivisions, $337,215 (completed). Strengthening additional bridges, Moosehead subdivision, $367,060 (completed). Restoration of port facilities destroyed by fire, West St. John and Bay Shore, N. B., $333,852 (completed). Grade separation, Laviolette street, Trois Rivieres, Que., $127,850 (completed). Postal and telegraph building, Regina, Sask., $400,000 (completed). Extension to station, new power plant, coach yard and incidental facilities, Regina, Sask., $1,240,000 (90 per cent completed). Line diversion to eliminate high-level bridge, M. P. 4.02, Neptune subdivision, $204,053 (80 per cent completed). North End terminal, Park avenue, Montreal, Que., $1,170,000 (completed). Strengthening Ste. Anne's bridge, M. P. 16, Winchester subdivision, $162,500 (completed). Strengthening bridges, Galt subdivision, $442,820 (completed). Branch line, St. Malo to Wolfe's Cove, Montreal, Que., including tunnel one mile long, $1,790,387 (completed). Tunnel to connect main line with False Creek yard, Vancouver, B. C., $500,000 (32 per cent completed). Lakeside Inn and five cottages, Yarmouth, N. S., $415,000 (completed). Quarters for help, New Pines Inn, Digby, N. S., $135,000 (completed). Club house for Canadian Pacific Amateur Athletic Association, Montreal, Que., $120,000 (completed). Terminal improvements, Toronto, Ont., $3,000,000 (completed).

Pacific Great Eastern

First Track: Mile 117.95 Squamish subdivision to Mile 2.46 Lillooet subdivision, 5.37.

Important Work Undertaken: New yard and terminal, Lillooet, B. C., including bridge over Frazer river, $600,000 (completed).

Temiskaming & Northern Ontario

First Track: Moose river crossing, M. P. 142, P. Ont., to Moose Harbor, 45 miles.

Toronto, Hamilton & Buffalo

Important Work Undertaken: Grade separation, Silver street on King's highway No. 20, 9.63 miles west of Welland, Ont., $139,000 (completed). Grade separation, King's highway No. 20, 31.58 miles west of Welland, Ont. (completed). Grade separation, King's highway No. 2, Brantford, Ont. (completed). Grade separation between east portal of tunnel and Victoria avenue, Hamilton, Ont., $2,900,000 (70 per cent completed). Replacing bridge over Chippewa river with double-track bridge, Welland, Ont., $128,000 (completed).

Newfoundland

Important Work Undertaken: New locomotive shop, St. John's N. F., $187,000 (completed).

Railway Construction in Mexico

National Railways of Mexico

First Track: Mexico-Tampico Short Line, 4.2 miles.

Important Work Undertaken: Mexico-Tampico Short Line, 333.7 miles (23 per cent completed, 50.2 miles in operation). Gulf Coast Line, Tampico to Vera Cruz, 312.8 miles (16.7 per cent completed, 48 miles in operation). Calles to Guerrero, 78.7 miles (completed, line reported in operation last year). Locomotive and car shops, Monterey, N. L. (completed).

Important Work Projected: New lines authorized: Empalme de el Oro to Sierra Mojada. San Carlos to Villa Acuna. El Salto to Mazatlan (Durango to Mazatlan extension).

(New Lines Under Survey). Soledad to Puerto de Tuxpan (surveys completed). Aristeo to Apatzigan (surveys completed).

(New Lines Projected). Sierra Mojada to Jimenez. Zacatecas and Berriozabal to La Honda. Rosario to Inde. Inde to Descubridora. Inde to Tepehaunes. Tepehaunes to Guanacevi Pureto Mexico and Sta. Lucrecia to Campeche. Balsas to Acapulco. Tehuacan and Tezonapa to Rio Blanca. Balsas to Zihuatanejo. Coapa to Coyuca. Ejutla to Puerto Angel. Tlacolula to Tehuantepec.

Supply Field's Prospects for 1932

(Continued from Page 9)

000,000 for the 15 months January 1, 1932, to March 31, 1933, when the sanction for these emergency advances expires. The object of the loan pool is to provide lines in distress with bond interest. The amount required is about as easy to grasp as mercury. The needy railways are identified and their interest requirements known, but nobody will risk his reputation on a guess at the funds they will have from earnings on other sources. One conjecture is $65,000,000. Out of $120,000,000, this would leave $55,000,000 to go pro rata as free money to the roads that earned it. The actual cash can hardly be available for maintenance until the Credit Corporation is wound up in 1933; but most systems to which it is ultimately due can doubtless spend it before that against reimbursement. The advances to weak roads are loans, and if, when and as they are repaid the sums so passing will be earnings transferred from a line which cannot readily spend the money on maintenance to a line that can. Short of a business upturn it is unlikely that the lenders will count upon getting their principal back during 1932.

The decision also exhorted the railways' traffic officers to explore the whole rate structure for opportunities to increase revenue by adjustments upward or downward, and promised to cut red tape for speed in getting the changes into effect if approved. Results from this are problematical, perhaps astronomical, certainly not at present statistical.

Effects of Possible Wage Reductions

Finally there are the wage cuts. It is estimated that a 10 per cent reduction in rates of pay would release $230,000,000 for other operating requirements. As I write it is reported that the roads will start a proceeding under the Act for a 15 per cent cut, the proposal to be cancelled if an agreement is reached for speedier reductions. The purpose, of course, of the labor organizations in responding to the wage-reduction proposal with an offer to negotiate is to couple with the wage rates other changes in conditions. Since the only changes in which the men can now be interested are those designed to give labor as much pay as possible, whether through staggering or otherwise, the only obvious way in which the railways can obtain relief in this direction without dragging referenda and conferences out for eight months is to grant concessions practically reducing the $230,000,000 to some lower figure or make the basic cut greater than 10 per cent. As good a guess as any is, that a wage adjustment would contemplate a saving of about $200,000,000, on the year. Effective not long after January 1, by open weather this would have accumulated two or three months' quota of saving on wages available for maintenance. From then on each month would make its contribution from that source to current maintenance.

We have, then, a business man's guess that during 1932, without an upturn in business, net operating revenue may increase as follows:

Rate advances sanctioned prior to 15% case	$70,000,000
Balance in pool above loans (12 months)	55,000,000
Wage cuts	200,000,000
Total	$325,000,000

Some of this would go for interest, but a large part for improvements and upkeep. For an officer of the Railway Business Association writing in the *Railway Age,* it is superfluous to remark that such an increase in maintenance spending or anything approaching it would in ordinary times itself launch business recovery. If a solution is found for the menace of German collapse, in which one factor is the commercial commitments, heaviest in Germany, of the uncontrollable and unhelpable Soviets, I for one would think our self-contained country could and would be pulled out of stagnation by its own power. Railway purchases can do it if anything can.

President Hoover proposes a Reconstruction Finance Corporation, listing railways with other industries whose credit is to be assisted. In plain terms this means that whereas the loan pool is to prevent receiverships by meeting interest on bonds not yet matured, the Reconstruction Finance Corporation would prevent receiverships by aiding the credit of railroads which must refund issues at maturity. It seems to be clearly recognized at the White House and in Congress that prevention of railway receiverships is a measure for promotion of business recovery. Indeed, there is strong impression at Washington that Congressmen new and old, radical and conservative, have one and all been hit by the depression in their individual lives or the lives of those near them, and are in a sober mood.

THE EXTENSIVE INSTALLATION of centralized train control on the Boston & Maine, in course of construction for the past year or more, was completed on December 26, when the section centering at Biddeford, Me., was put in operation. This road has altogether 159 miles of track operated by means of centralized control machines.

A Winter Scene in the Supply Yard of the Soo at Minneapolis, Minn.

Prices of Railway Materials Further Reduced in 1931

Business conditions and curtailed purchases force many values to pre-war levels

By David A. Steel

Purchases and Stores Editor, Railway Age

CONTRARY to expectations commonly held at this time last year, business conditions grew worse instead of better during 1931, with the result that the railways bought less and paid less for what they bought than in many previous years. The price changes were not all alike, however, many commodities costing the roads as much, or almost as much, as in 1930. This was especially true of finished products peculiar to railway use, including many iron and steel items. Here and there, higher prices were paid as the inevitable result of small and hurried orders, and considerable difference again prevailed between the prices paid by individual roads for many comparable products. But in almost every case where price changes occurred, revisions were downward, and these downward revisions were more general and, except for the price changes in 1930, they were larger than in many years. Reductions of 25 per cent and more in many items brought the average price of railway materials down about 15 per cent. Pre-war prices were numerous.

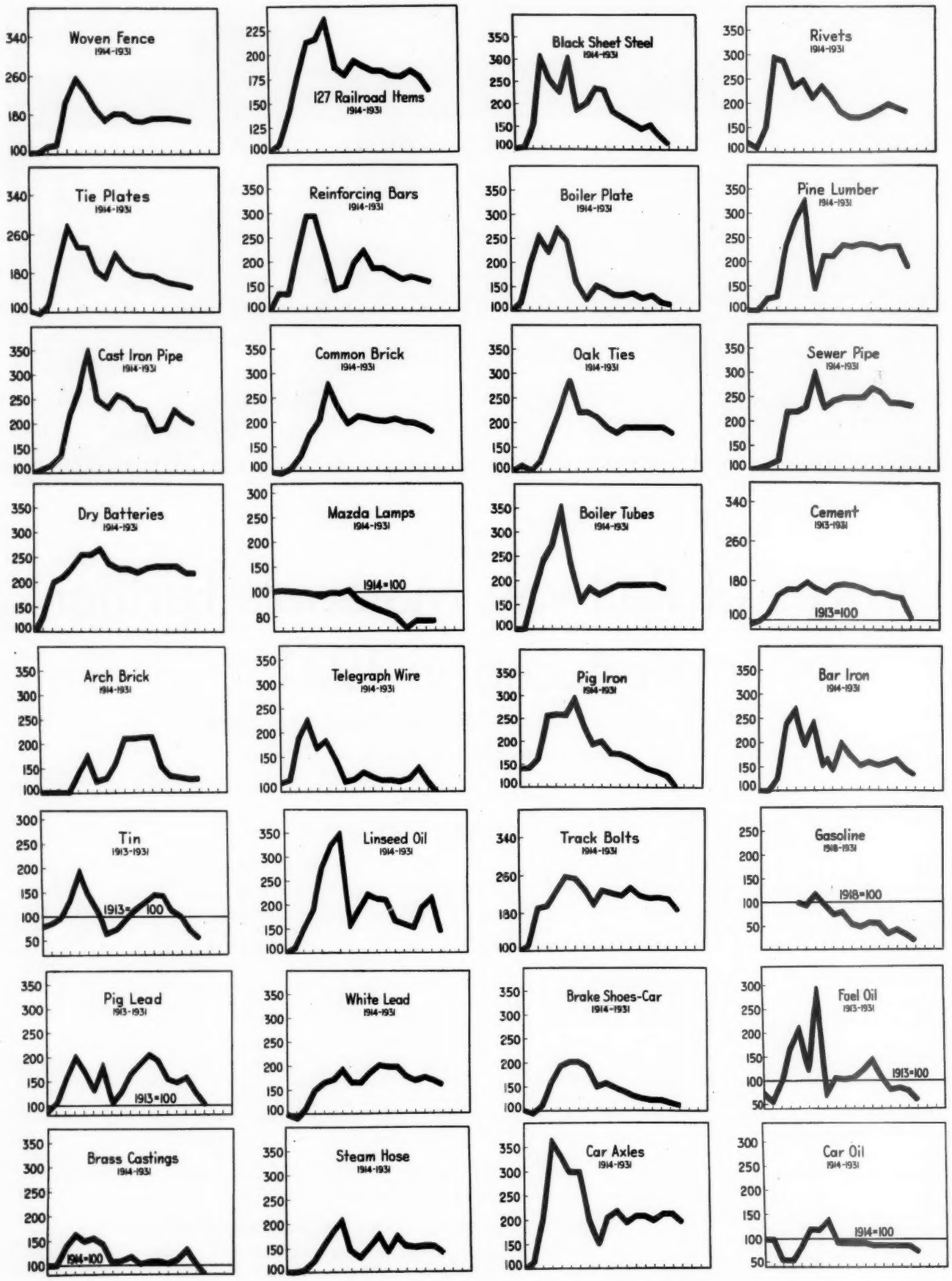
Purchases Reduced

Based on special reports received from a large number of representative roads covering purchases for the first 10 months, direct expenditures of Class I roads for material and supplies approximated 695 million dollars in 1931. This was 343 million dollars, or 33 per cent, less than were the purchases in 1930, and 634 million dollars, or 47.5 per cent less than the purchases in 1929. It is estimated that the 1931 figures include a reduction of 50 million dollars or more attributable to the lower prices.

Only two roads among more than 50 spent more during the first 10 months of 1931 than they spent in 1930, and many roads spent as much as 35 per cent less, while purchases on several roads ranged from 50 to 60 per cent below those for corresponding purchases in the preceding year. Expenditures ran above 60 million dollars per month during 1931, but the curtailment of purchases was unprecedented in the history of many of the roads.

Iron and Steel Prices Slightly Lower

After dropping from a rated production of 86 per cent of capacity in the spring of 1930 to 40 per cent in December of that year, the iron and steel industry grew optimistic when the spring of 1931 pushed operations up to 50 per cent of capacity, and was encouraged to

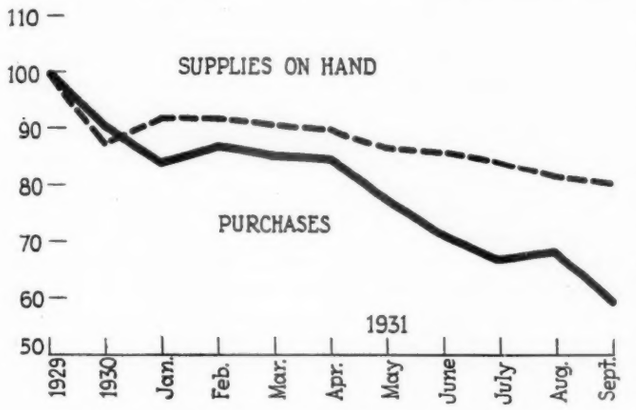


Price Range of Railway Materials from 1914 to 1931, Inclusive, Using 100 as Commodity Index in 1914

revise upward the prices of some commodities such as wire and sheets, but the recovery was discounted by the end of March and operations continued to decline to the end of the year. Vigorous competition between independent mills and different territories for the available business became acute and advertised prices became less reliable as measures of market value. Pig iron at $15.17 in December was 15 per cent below the 1930 low price and the lowest since 1915, although average prices of finished steel reflected little change. A few upward revisions in advertised prices have been made in recent weeks to apply to 1932 purchases, but the weakness in prices was still evident during December.

Little Change in Track Materials

Of the iron and steel products purchased by railways, the items for use in maintenance of way were the least affected. One road among 13 paid $3 a ton less and another $4 a ton less for tie plates than in 1930, while all the others paid within $1 per ton as much. One road paid 10 per cent under the 1930 price for its track bolts, and four others secured 5 to 10 per cent reductions as the year advanced, the other roads buying this



Comparative Trends of Total Supplies on Hand and Purchased, Based on 100 as Index in 1929

commodity at about the same price paid in 1930. The largest reduction in track chisels was under 20 cents, or about 15 per cent, but this was not general. Track spikes were from 5 to 10 per cent under the 1930 prices to seven roads. The reductions were from 5 to 10 per cent on wire fencing. Five among seven roads secured reductions ranging from 35 cents per cwt., or 3 per cent, to $1.25 per cwt., or 7 per cent, on track shovels. Cast-iron pipe prices were hard hit in spots, one road paying $7.90 a ton, or 20 per cent less in December than in January. The reduction of 30 per cent in structural steel angles to one road was exceptional, and several roads purchased at approximately 1930 prices, but 15 cents, or 20 per cent, reductions were quite common on fabricated steel prices.

Car and Locomotive Materials Cut

Several roads secured reductions of approximately 20 per cent in machine bolts, but boiler tubes showed virtually no change in price from the 1930 level. Most roads also purchased bar iron at the 1930 rate. Several roads paid more for spring steel, and tool steel was bought at lower prices by only one of nine roads. About half the roads secured reductions up to 8 per cent in boiler steel, while light steel sheets cost three of nine roads 5 per cent more in December than in January. Most of the roads were able to buy brake shoes from $1 to $3 a ton cheaper, a maximum reduction of 5 per cent. A 10-per cent reduction prevailed on malleable castings. Two roads paid 30 per cent less for steel castings as the year advanced, but practically no change was noted in grey iron castings.

A reduction of $1.50, or 5 per cent, was common in coupler purchases, but 1930 prices were paid in nearly all cases for steel pipe. Reductions ranging from 5 to 30 per cent were obtained in wire nail purchases, but one road paid 10 per cent more in December than in January. Pig iron was obtained at the lowest price in a decade, while most of the prices paid for axles were the same as in 1930, reductions obtained by three roads being less than 10 per cent. A prevalent reduction of

Prices Paid by Railroads for Material in 1931

Material	Unit	Roads	Highest	Lowest	1931 Avg.	1930 Avg.
Maintenance of Way Materials						
Tie plates, steel	n.t.	14	$43.00	$38.50	$38.88	$41.22
Track bolts, com., with nuts	cwt.	14	3.81	3.10	3.74	3.97
Track chisels	ea.	13	1.80	1.63	1.64	1.71
Track spikes	cwt.	14	2.76	2.20	2.57	2.68
Wire fence, woven	rod	11	.48	.32	.38	.43
Track shovels, No. 2	doz.	13	16.90	7.88	9.98	9.85
Bond wire, copper clad	cwt.	8	17.83	13.93	15.89	17.14
Pipe, cast iron, 12-in.	n.t.	6	40.80	31.80	35.58	40.37
Pipe, clay, 24-in. vit.	ft.	7	2.02	.67	1.40	1.27
Soda ash, water softening	cwt.	13	2.90	.82	1.18	1.55
Hydrated lime, water softening	n.t.	13	12.10	6.85	9.73	9.53
Cement, Portland, less sacks	bbl.	14	2.25	.83	1.44	1.75
Steel, structural, angles	cwt.	14	2.53	1.55	1.84	1.98
Steel, structural, fabricated	cwt.	9	3.28	2.24	2.73	3.35
Creosote oil, tank lots	gal.	10	.16	.09	.115	.125
Shop and Equipment Materials						
Bolts, ¾ by 6 mach., with nuts	100	14	6.72	3.49	4.20	4.80
Flues, 2-in. No. 11 steel	ft.	13	.16	.15	.152	.155
Fire brick, soft	per M	13	45.50	36.00	38.29	41.85
Copper, sheet, soft	lb.	10	.319	.121	.181	.259
Copper tubing, ⅜-in.	lb.	9	.31	.138	.293	.26
Pig lead	cwt.	13	5.55	3.40	4.42	5.64
Iron, common bar	cwt.	9	2.10	1.67	1.80	1.89
Steel, spring	cwt.	12	3.50	1.80	2.43	2.62
Steel, high-speed tool	lb.	14	.66	.45	.52	.65
Rope, ¾-in. 6 str. plow steel	ft.	8	.20	.11	.14	...
Steel, boiler	cwt.	14	2.47	1.70	1.86	2.90
Steel, 24-gage black	cwt.	13	3.54	2.15	2.65	2.90
Brake shoes, loco. driving	n.t.	13	60.00	54.00	56.54	58.75
Brake shoes, freight	n.t.	13	50.00	33.00	35.13	35.11
Castings, grey iron, green sand	cwt.	10	4.85	3.20	4.10	4.12
Castings, mall., 7 to 15 lb.	cwt.	14	9.75	4.50	7.68	8.27
Castings, steel, 25 to 50 lb.	cwt.	14	10.05	3.95	7.73	8.05
Journal bearings	cwt.	10	14.00	7.37	10.05	14.50
Couplers, 5 by 7 by 6½	pr.	14	41.25	29.50	36.05	38.25
Pipe, 1-in. black steel	ft.	14	.094	.055	.069	.069
Wire nails, common	cwt.	14	2.45	1.72	2.08	2.29
Wire, No. 9 bare	lb.	8	.127	.092	.115	.163
Wire, T. B. weather No. 10	lb.	8	.20	.13	.16	.19
Fuel oil, tank lots	bbl.	11	1.76	0.20	.65	.62
Iron, No. 1 pig	g.t.	6	17.50	12.00	15.38	16.60
Axles, loco. driving	cwt.	14	8.00	4.21	4.76	4.29
Axles, 5 by 9 rough turned car	cwt.	13	3.60	2.60	2.88	2.80
Tires, frt. loco., 33-in. and over	cwt.	14	7.49	5.40	6.03	6.15
Miscellaneous Materials						
Oil, car—tank lots	gal.	13	.20	.10	.138	.163
Grease, driving box	lb.	13	.144	.102	.122	.130
Waste, colored cotton	lb.	14	.102	.049	.076	.085
Oil, long-time—in tanks	gal.	14	.130	.021	.062	.085
Boiler lagging, 1¼-in.	sq. ft.	14	.212	.120	.155	.160
Rubber, 3/32 sheet packing	lb.	14	.48	.13	.23	.20
Hose, air-brake, 1⅜ by 22	ft.	14	.41	.33	.38	.44
Leather belting, 6-in. double	ft.	14	2.30	.80	1.23	1.35
Rope, ¾-in. manila	lb.	13	.185	.102	.153	.180
Glass, 24 by 24 dsa	box	14	6.54	3.27	4.80	5.80
Linseed oil, boiled	lb.	12	.136	.079	.090	.130
White lead in oil, 100-lb. keg	lb.	14	.127	.086	.101	.106
Oxygen	100 ft.	14	1.25	.75	1.07	1.05
Ties and Lumber—Mill						
Fir, 1 by 6, No. 1 com. R.	M ft.	6	12.00	9.00	10.83	15.55
Pine, 2 by 4, S4S, No. 1 com, M ft.		5	26.00	10.50	18.93	25.85
Car sills, fir, 6 by 10 by 40	M ft.	6	17.00	11.00	14.50	19.40
Stringers, fir, 8 by 16 by 28	M ft.	5	17.00	13.50	14.90	18.70
Ties, fir, 7 by 9 by 8'6 untreat.	ea.	6	.59	.37	.40	.74
Ties, pine, 7 by 9 by 8'6 untreat.	ea.	9	1.22	.37	.81	.75
Ties, w. oak, 7 by 9 by 8'6 untreat.	ea.	8	1.20	.49	.78	.92
Scrap Iron						
Scrap iron, No. 1 wrought	n.t.	13	10.03	3.75	7.20	8.70
Scrap iron, No. 1 melt	n.t.	14	9.38	4.25	7.33	10.62
Scrap iron, rails for re-roll	n.t.	9	12.25	6.00	10.05	12.55

Note—Averages determined from prices paid in January, June and December of each year. Do not show reductions obtained by individual roads.

Trend of Railway Purchases by Months, 1929-1931

20 cents per cwt. in locomotive tire buying was only 2 per cent under 1930 prices.

Lowest Scrap Iron Prices

Scrap-iron prices have been declining for several years and fell so sharply in 1930 that some roads began to doubt the propriety of selling their scrap and stored it for a better market. During 1931, however, scrap prices continued to decline, with a glutted market and inactive steel operations. Some roads sold heavy melting steel under $4.25 per ton, and the average price of all scrap was lower than at any time since 1922, and in some districts was the lowest since 1914.

Fuel Prices Off Slightly

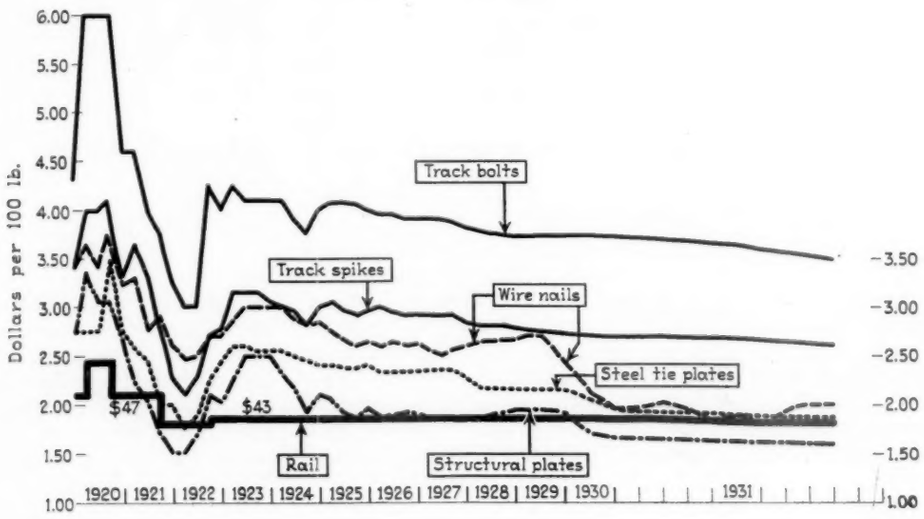
The continued reduction in operations of all industries in 1931 was felt in the coal industry and further weaknesses in prices developed. Both anthracite and bituminous coal were affected. Reductions in wages in the non-union fields accentuated the competition in the Eastern district and the bituminous fields were affected by the over-production of fuel oil and the inroads of gas lines. While roads have been inclined to pay prices equal to or higher than commercial rates for coal located on their lines to assure coal industries fair prices for their commodities and while they have also preferred to pay established prices throughout the year and discourage the bargaining for distress coal, most of the roads purchased their coal from 5 to 10 cents a ton less during 1931 than in 1930, and several roads paid 25 to 50 cents per ton less, the average mine price of coal to the railroads as a whole falling off 15 cents per ton, or 8 per cent. Prevailing coal prices compare with those charged in 1915 to 1917.

Fuel-Oil Prices

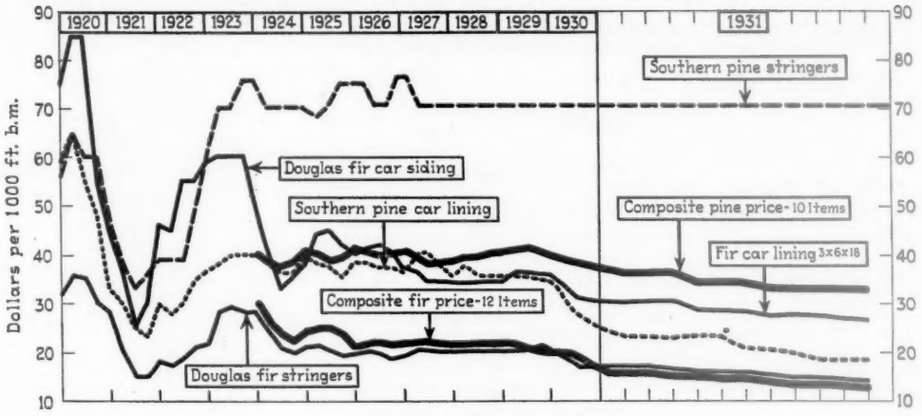
Over-production of crude oil has caused declines in the price of fuel oil for several years, but an unusually favorable condition for buyers prevailed last year when increased production on the one hand and reduced purchases on the other forced sizable refineries out of business and made it possible for a larger number of roads than before to contract for fuel oil at 65 cents to 75 cents a barrel, while some roads, particularly those having storage facilities, were able to secure their supply by making spot purchases as low as 25 cents a barrel. These prices represent 50-per cent reductions from the prices paid by the same roads in many cases. While shut-downs in the Texas and Oklahoma fields, enforced by martial law, have had a tendency to strengthen prices, practically all roads secured reductions of 25 per cent or more in kerosene in the latter part of the year, and gasoline was also purchased at lower prices than in 1930. These changes were not reflected to the full extent in the cost of oils and greases for lubrication, which are ordinarily purchased under term contracts from large refineries, but several roads paid from 10 to 20 per cent less for these commodities.

Lumber and Ties Much Lower

Excepting scrap iron, lumber prices appear to have been the hardest hit during 1931. The prices in the Southern Pine territory seem to have been less depressed than prices in other fields, but firm prices were



Movement of Typical Track Materials since 1920



Comparative Price Range of Lumber Items, 1920-1931

conspicuous by their absence except for special cuttings. The average price of 10 Southern Pine items, including long leaf items, declined from $38.40 per 1,000 ft. B.M., in 1930, to $33.70 per 1,000 ft. B.M. in 1931.

On the Pacific coast, production was 30 per cent less than in 1930, with half of the mills shut down. Early in the year, most of the operating mills continued purchasing at normal capacity in order to keep their employees at work, however, and this tended to increase the stocks on hand which only served to depress prices further. The situation in Western Canada was somewhat comparable to that in the Douglas Fir region in that production was only 30 per cent of normal during the year with only 29 of 40 mills functioning. Price trends in the West are indicated by the fact that car lining, costing $25 in 1930, was purchased at $19 in 1931, and timbers, costing $15 in 1930, were sold at $10 in 1931. The *Railway Age* composite price of fir fell from $17.80 per 1,000 ft. B.M. in 1930 to $14.20 per 1,000 ft. B.M. in 1931, and the West Coast Lumbermen's Association's composite price of 110 rail items fell from $21.75 in 1929 to $12.23 in October, 1931.

Tie Prices Varied

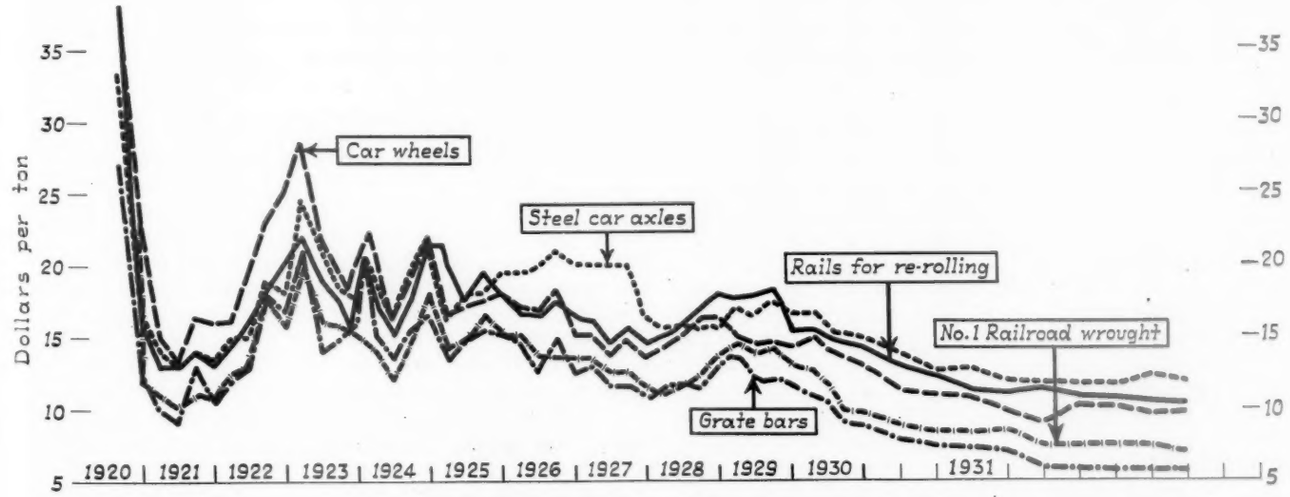
Trends in tie prices, resulting both from the reductions in ties purchased by the railroads and the lack of any other source of income for many tie producers were also sharply downward in practically all but Southern Pine territories. Fir cross-tie prices on the Pacific coast declined from $15 in 1930 to $11 in 1931, based on the board-foot measure. One representative road purchased fir ties at 45 cents each in 1931, as compared with 58 cents in 1930. Pine tie prices showed less reduction during the year, but 30-per cent reductions were common in white oak ties. Some lumber prices in 1931 compared with those prevailing in 1913 and 1914, while all lumber items cost the roads less than since 1920.

Non-Ferrous Metals Reduced

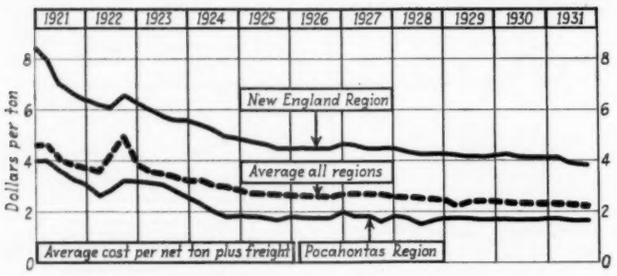
The prices of copper, lead, tin and zinc fell to new low records in 1931, in spite of efforts to reduce production; and the failure of the copper producers to reach an amicable agreement last fall regarding world operations caused further weaknesses in the price of this commodity. Lake copper fell from $10.12 per cwt. in January to $7.37 in October; tin from $26 to $23; zinc from $4 to $3.65; and lead from $4.55 to $3.75. In sympathy with this trend in the prices of the basic materials, journal-bearing costs to railroads declined $2.50 to $3.30 per cwt., or 30 per cent, and similar reductions were effected in copper wire and brass castings, although to a lesser degree. It is necessary to go back more than 15 years to find the low prices prevailing in 1931 for non-ferrous metals.

Cement Prices Fall

A feature in the market for miscellaneous materials was the break in the prices of cement. For several years, cement has been sold in this country at closely-



Movement of Scrap-Iron Prices since 1920



Trend of Average Regional Coal Costs for the Class I Railroads, as Reported to I. C. C.

controlled prices, but with the increasing number of independent mills and a prolonged business depression, the structure of the cement industry at last reached the breaking point, and cement prices fell precipitously during the year, all roads studied paying from $1.45 to $2 a barrel less for cement than in the previous year, two roads paying 80 cents per barrel, or less.

Little if any reduction was secured by the railroads in the price of oxygen, but reductions from 10 per cent to 30 per cent were secured in the prices of chemicals for water treatment and in such commodities as waste,

journal packing, linseed oil, glass and rubber commodities. Air-brake hose, like boiler lagging, however, cost virtually as much in 1931 as in 1930.

Average Cost of Coal Per Ton—First Nine Months

Region and road	With freight 1931	With freight 1930	Without freight 1931	Without freight 1930
New England Region:				
Bangor & Aroostook	$4.39	$4.59	$4.39	$4.59
Boston & Albany	4.18	4.28	1.79	1.94
Boston & Maine	4.15	4.56	3.57	4.56
Canadian National (in New Eng.)	4.78	4.98	2.01	2.08
Canadian Pacific (lines in Maine)	5.23	5.43	3.42	4.26
Canadian Pacific (lines in Vermont)	4.91	5.04	1.87	1.94
Central Vermont	4.43	4.59	1.55	1.56
Maine Central	4.52	4.85	4.52	4.85
New York, New Haven & Hartford	3.39	3.48	1.10	1.18
Rutland	3.74	3.99	2.27	2.57
Great Lakes Region:				
Ann Arbor	2.90	3.02	1.10	1.24
Buffalo, Rochester & Pittsburgh	1.69	1.75	1.69	1.75
Delaware & Hudson	3.00	3.14	1.75	2.35
Delaware, Lackawanna & Western	3.04	3.16	1.59	1.83
Detroit & Mackinac	3.40	3.54	1.10	1.27
Detroit & Toledo Shore Line	3.30	3.38	2.01	2.04
Erie and Chicago & Erie	2.26	2.40	1.70	1.70
Grand Trunk Western	2.83	3.04	1.17	1.38
Lehigh & Hudson River	3.61	3.70	1.15	1.33
Lehigh & New England	2.83	2.89	1.27	1.36
Lehigh Valley	3.07	3.17	1.21	1.33
Michigan Central	2.15	2.75	1.97	2.39
Monongahela	1.46	1.58	1.46	1.58
Montour	1.94	2.01	1.94	2.01
New Jersey & New York	4.60	4.74	1.78	1.89
New York Central	2.00	2.20	1.67	1.81
New York, Chicago & St. Louis	2.66	2.66	1.73	1.73
New York, Ontario & Western	2.77	2.96	.98	1.17
New York, Susquehanna & Western	4.29	4.41	1.70	1.85
Pere Marquette	3.34	3.39	1.52	1.58
Pittsburgh & Lake Erie	1.74	1.77	1.68	1.65
Pittsburg & Shawmut	1.79	2.22	1.79	2.22
Pittsburgh & West Virginia	1.24	1.25	1.24	1.25
Pittsburg, Shawmut & Northern	1.80	1.80	1.80	1.80
Ulster & Delaware	4.15	4.24	1.59	1.67
Wabash	2.18	2.24	1.73	1.78
Central Eastern Region:				
Akron, Canton & Youngstown	2.41	2.48	1.39	1.46
Atlantic City	3.43	3.50	1.52	1.84
Baltimore & Ohio	1.41	1.56	1.37	1.53
Bessemer & Lake Erie	1.94	2.00	1.85	1.92
Buffalo & Susquehanna	1.56	1.62	1.56	1.62
Central of New Jersey	3.28	3.44	1.39	1.54
Chicago & Eastern Illinois	2.00	1.98	1.97	1.94
Chicago & Illinois Midland	2.03	1.90	2.03	1.90
Chicago, Indianapolis & Louisville	1.83	1.85	1.83	1.85
Clev., Cin., Chic. & St. Louis	2.31	2.25	1.90	1.94
Detroit, Toledo & Ironton	2.64	2.78	1.55	1.71
Elgin, Joliet & Eastern	2.08	2.11	2.08	2.11
Illinois Terminal	2.30	2.64	2.30	2.64
Long Island	3.81	3.85	1.51	1.62
Missouri-Illinois	1.68	1.75	1.68	1.75
Pennsylvania System	1.72	1.82	1.69	1.79
Reading Company	2.74	2.88	1.47	1.69
Staten Island Rapid Transit	4.09	4.09	1.74	1.75
Western Maryland	1.78	1.81	1.76	1.80
Wheeling & Lake Erie	1.47	1.55	1.47	1.55
Pocahontas Region:				
Chesapeake & Ohio	1.61	1.62	1.61	1.62
Norfolk & Western	1.55	1.57	1.55	1.57
Richmond, Fredericksburg & Potomac	3.31	3.45	1.12	1.27
Virginian	1.75	1.95	1.75	1.95
Southern Region:				
Alabama Great Southern	2.33	2.41	1.89	1.93
Atlanta & West Point	2.91	3.05	1.63	1.70
Atlanta, Birmingham & Coast	2.08	1.93	1.68	1.51
Atlantic Coast Line	2.83	2.94	1.30	1.39
Central of Georgia	2.20	2.20	2.10	2.11
Charleston & Western Carolina	2.69	2.75	1.32	1.38
Cin., New Orleans & Texas Pac.	1.90	2.00	1.61	1.73
Clinchfield	1.36	1.43	1.36	1.43
Columbus & Greenville	2.63	2.62	1.48	1.49
Georgia	3.09	3.19	1.24	1.35
Georgia & Florida	3.01	3.04	1.47	1.50
Georgia, Southern & Florida	4.01	3.98	2.04	2.05
Gulf & Ship Island	3.13	3.44	1.25	1.53
Gulf, Mobile & Northern	2.00	2.00	1.21	1.26
Illinois Central	1.90	2.02	1.69	1.80
Louisville & Nashville	1.65	1.77	1.65	1.77
Mississippi Central	2.61	2.74	1.08	1.22
Mobile & Ohio	1.97	2.02	1.97	2.02
Nashville, Chattanooga & St. Louis	1.95	1.99	1.86	1.90
New Orleans & Northeastern	3.54	3.62	1.86	1.95
New Orleans Great Northern	2.72	2.76	1.29	1.30
Norfolk Southern	3.09	3.22	1.13	1.20
Northern Alabama	1.44	1.61	1.44	1.61
Seaboard Air Line	2.49	2.68	1.33	1.36
Southern	1.53	1.60	1.46	1.53
Tennessee Central	1.79	1.84	1.79	1.84
Northwestern Region:				
Chicago & North Western	1.83	1.86	1.83	1.86
Chicago Great Western	2.68	2.76	1.44	1.61
Chicago, Milwaukee, St. Paul & Pacific	2.25	2.39	2.25	2.36
Chicago, St. Paul, Minn. & O.	3.84	3.83	3.52	3.54
Duluth, Missabe & Northern	4.32	4.14	4.32	4.14
Duluth, South Shore & Atlantic	3.96	4.07	3.56	3.64
Duluth, Winnipeg & Pacific	4.04	4.23	3.70	3.94
Great Northern	3.09	3.37	3.08	3.36
Green Bay & Western	4.51	4.55	4.51	4.40
Lake Superior & Ishpeming	3.80	3.74	3.80	3.74
Minn. & St. Louis	2.15	2.20	2.04	2.00
Minneapolis, St. P. & S. Ste. Marie	3.61	3.71	3.08	3.22
Northern Pacific	2.62	2.69	2.61	2.69
Oregon-Wash. Rail. & Nav. Co.	4.52	3.97	2.43	2.27
Spokane International	5.22	5.15	3.33	3.24
Central Western Region:				
Atchison, Topeka & Santa Fe	2.93	2.98	2.91	2.93
Chicago & Alton	2.18	2.23	2.18	2.23
Chicago, Burlington & Quincy	2.13	2.17	2.08	2.12
Chicago, Rock Island & Pacific	2.44	2.48	2.31	2.28
Colorado & Southern	2.61	2.77	2.57	2.73
Denver & Rio Grande Western	1.82	1.97	1.81	1.96
Denver & Salt Lake	1.13	1.25	1.13	1.25
Fort Worth & Denver City	4.85	5.89	2.61	2.84
Nevada Northern	4.55	4.55	1.75	1.75
Oregon Short Line	3.16	3.16	2.59	2.59
Quincy, Omaha & Kansas City	2.46	2.63	2.46	2.63
St. Joseph & Grand Island	3.15	3.56	2.80	3.17
Southern Pacific Company	3.15	3.03	3.15	3.03
Toledo, Peoria & Western	2.36	2.85	1.80	1.45
Union Pacific	2.55	2.54	2.53	2.51
Utah	1.05	1.06	1.05	1.06
Western Pacific	3.04	3.11	1.80	1.88
Southwestern Region:				
Fort Smith & Western	3.19	3.47	3.19	3.47
Kansas City Southern	2.19	2.50	2.19	2.50
Kansas, Oklahoma & Gulf	2.69	2.61	2.69	2.61
Midland Valley	2.58	2.65	2.58	2.65
Missouri & North Arkansas	2.94	2.86	2.55	1.35
Missouri-Kansas-Texas	2.81	2.99	2.53	2.69
Missouri Pacific	2.05	2.16	2.02	2.09
Oklahoma City-Ada-Atoka	2.90	3.01	2.90	3.01
St. Louis-San Francisco	2.28	2.38	2.16	2.24
St. Louis, San Francisco & Texas	4.29	4.30	3.21	3.22
St. Louis Southwestern	1.87	2.20	1.07	1.33

Purchases and Prices in 1932

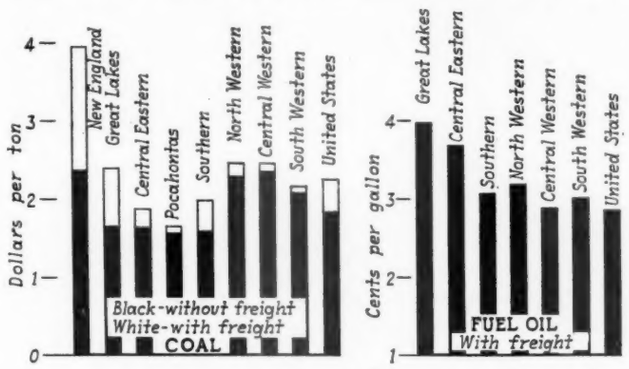
Regarding the expectations this year, four among 11 roads anticipate increased fuel prices, one lower prices. Four roads expect increases in iron and steel prices, none lower prices. Seven roads anticipate increases in lumber prices, one lower prices. Eight roads expect increases in the prices of scrap iron, none lower prices. Five roads anticipate higher tie prices; one anticipates lower prices.

Obviously, any increases, for the most part, in commodity prices this year depend more on increased buying and increased industrial activity than upon any agreement among mills and producers, or other artificial stimulants.

Five among 11 roads expect to buy more fuel and one less fuel; four more rail and two less rail. Four expect

to buy more ties; two, fewer ties. Four roads expect to buy more lumber; three, less; while seven roads expect to buy more miscellaneous materials and two expect to buy less.

Points in favor of increases in railway purchases are found in the extraordinary reduction in the purchases of all materials since October, 1929. The trend appears in one of the charts and indicates that purchasing is now at its lowest ebb. Monthly records of inventories (shown in one of the charts) do not show much reduction in the book value of materials on hand, and, when considered in comparison with purchases, show an increase in the month's supply on hand at prevailing rates



Average Regional Costs of Coal and Fuel Oil for the Class I Railways in 1931

of consumption; but it is known that the inventories for routine material are low and that the properties are in need of repairs which cannot be postponed much longer. It is also recognized that considerable purchasing has been avoided in the last year by appropriating parts from idle equipment for making repairs to equipment in use. Increase in business calling for the employment of equipment which has been out of service is thus bound to accelerate purchasing.

Steel prices are likely to feel the effect of any increased purchases, considering the firmness with which some prices were sustained throughout 1931. The control being secured over oil production, the diminishing proportion of fuel oil to crude oil resulting from improvement in gasoline-refining methods, and the possibility of increased taxes on oil sales are price-strengthening factors in that field. A resumption of tie buying will tend to increase prices in those cases where mills or tie organizations rather than individual farmers are counted upon for the supply, and increases in freight rates allowed the railroads must also be considered in anticipating the cost of all commodities which are subject to them.

In the coal, oil and lumber industries, the reductions in wages that have been made or are pending, and the over-capacity of the mines and mills to supply any demand for standardized equipment which can be expected and the difficulty of financing operations are factors against appreciable increases in prevailing costs, even in the face of strenuous efforts to reduce the ratio of surplus stocks to sales orders, except where the sudden materializing of large repair programs and quick delivery for items requiring special preparation are required. On the whole, it is not expected that those prices which suffered the greatest reductions this year will change materially during the next six months, and it is not improbable that further reductions will occur in the prices of many commodities which up to the present time have not fully responded to the downward trend since 1929.

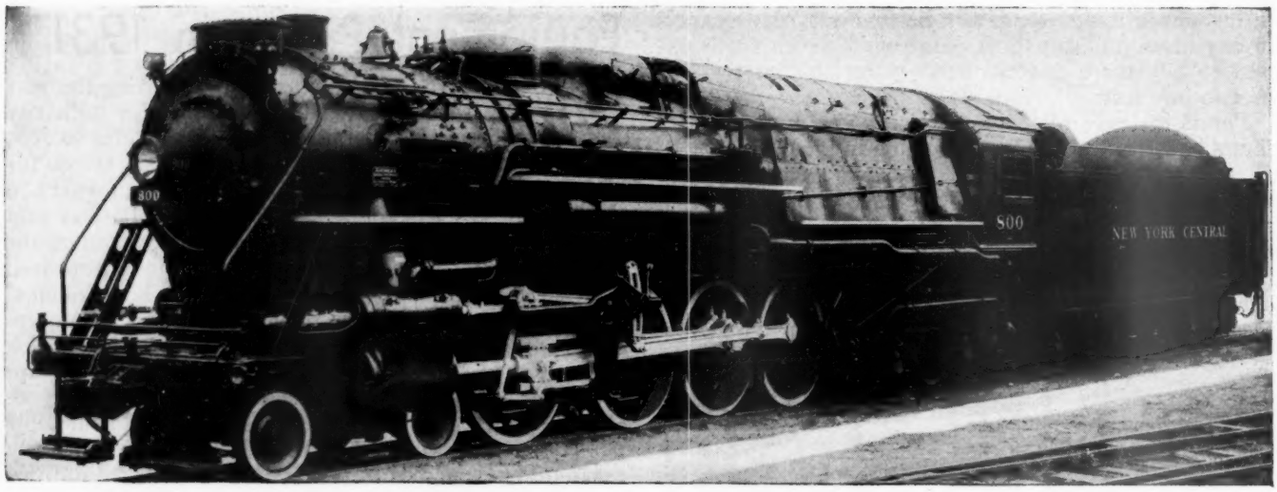
Equipment Prices in 1931

ORDERS for cars and locomotives during the year were so meager, and applications for authority for issues of equipment trust certificates so few, that really significant statistics on trends of prices for such equipment are not available. In former years in the annual statistical number the *Railway Age* has presented in tabular form the various equipment orders for which the Interstate Commerce Commission authorized the issue of equipment trust certificates. The Commission's findings in such cases specify the type of equipment to be purchased and the price to be paid for each unit. Other information about this particular equipment, obtainable from other sources, was likewise presented in these tables. The tables listed a considerable percentage of all equipment ordered, described it in some detail and gave the price paid. Those interested in price trends, therefore, by a study of these tables were able to draw significant conclusions from them.

Even if such price information were available for every single piece of equipment ordered in 1931, however, it would be unwise to draw definite conclusions from it, because too few figures frequently give a distorted picture. It is only when enough data are collected to be really representative that it is safe to draw averages from them. Equipment trust certificates were authorized during the past year for but a small fraction of the orders. Freight car orders, while few enough, were to a large extent dominated by those of private car companies which do not have to report to the Interstate Commerce Commission when they finance equipment purchases; hence the prices paid by such companies are not a matter of public record. Many of the locomotives for which orders were placed were purchased by companies which are not common carriers, and hence are not required to report. A large proportion of the railroad orders were for one or more experimental units, for which equipment trusts were not issued and the cost of which would not be significant, even if available. Passenger car orders were so nearly zero, that there could be no thought of giving any great weight to such figures as are available for the year 1931.

There are, however, in spite of the difficulties mentioned, some few data available which will serve at least to maintain the continuity of the record and these are presented herewith. One company secured authority to issue equipment trust certificates for 50 milk cars, ordered late in 1930, at a price of $8,015 each. These cars were 52 ft. 3⅝ in. long and weighed 85,000 lb. Similarly, equipment trust certificates were authorized for the following multiple unit equipment ordered in 1930: 12 coaches with motors, 79 ft. 7¼ in. long, weighing 176,000 lb., at a price of $76,532 each; 19 trailer coaches of the same length, weight 103,600 lb., price $30,646; two combination passenger-baggage trailers, length the same, weight 103,600, price $30,567. Four chair cars, 82 ft. 11½ in. long, weighing 146,500 lb., ordered in 1930 at a price of $33,796, were likewise financed by 1931 equipment trusts. Ten 70-ton flat cars, priced at $3,111 each, were recorded.

The following are some of the locomotive orders for which price data are available: six 2-10-4's, weight 460,200 lb., tractive force 97,900 lb. (with booster), price $94,546 each; four 2-10-2's, weight 405,600 lb., tractive force 88,200 lb (with booster), price $78,827; one 2-8-2, weight 305,000 lb., tractive force 54,600 lb., price $56,000; one 600 hp. oil-electric, weight 214,000 lb., price $100,562; ten 4-6-0 + 0-6-4 electrics, weight 400,000 lb., 3,430 hp., price $180,000.



Multipressure 4-8-4 Type Locomotive Built for the New York Central by the American Locomotive Company, With the Co-operation of the Superheater Company

Locomotives Ordered in 1931

Low total of 235 places past year among three poorest of present century – More electrics than steam ordered

By Walter J. Taft

Associate Editor, Railway Age

LOCOMOTIVES ordered for domestic service in the United States during 1931 totaled only 235 or slightly more than half the 440 ordered during 1930 and less than one-fifth of the 1,212 ordered during 1929. Nineteen thirty-one, therefore, from the point of view of the locomotive builder, becomes one of the poorest business years on record. In no other year of the present century, save 1919, have fewer locomotives been ordered for domestic service although the 1919 export business was then an offsetting factor.

Statistics of locomotive orders are compiled in the accompanying tables back to 1901. It should be pointed out in connection with this compilation that modern locomotives are far more powerful and far more costly than those of the days when yearly orders totaled thousands. Discounting this fact, however, an examination of the orders tabulated for the years of the past decade reveals in striking fashion the extremely poor locomotive market which prevailed as the depression, in so far as it affected railway traffic and earnings, gathered momentum during 1931. In only one other year of the past 10 have fewer than 500 locomotives been ordered and in only three other years were fewer than 1,000 purchased; the average per year for the decade was over 1,000. The 1931 business, as measured in units ordered, was therefore only about 20 per cent of the 10-year average.

Table I—Locomotive Orders in 1931

For service in the United States	235
For service in Canada	2
For export to other countries	28
Grand total	265

Paradoxical as it may seem in the light of the foregoing discussion, this depression year, 1931, was one of comparative prosperity in so far as orders for electric locomotives were concerned. The Pennsylvania orders for a total of 150 of these for use in connection with its extensive electrification program brought the total electrics ordered in any one year above the number of steam locomotives purchased for the first time. Two other electric locomotives were ordered last year so that the 1931 total for domestic service was 152 or

Table II—Orders for Locomotives Since 1901

Domestic Orders Only

Year	Locomotives	Year	Locomotives
1901	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1912	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	1,612	...	850	2,462
1916	2,910	...	2,983	5,893
1917	2,704	...	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	898	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542
1927	734	58	54	846
1928	603	98	27	728
1929	1,212	77	106	1,395
1930	440	95	20	555
1931	235	2	28	265

Prior to 1918, Canadian orders included under "Domestic."

more than twice the number of steam locomotives ordered, which was 62. In 1930 a total of 19 electric locomotives was ordered while 95 were purchased in 1929. The 1931 orders for oil-electric and gasoline-electric locomotives totaled 21 as compared with 20 in 1930 and 79 in 1929.

The situation in Canada was even more disheartening. Canadian roads, during 1931, ordered two locomotives from builders in that country. This compares with 95 ordered in 1930 and 77 in 1929. In no other year since 1918, when the segregation of Canadian orders in the accompanying table was begun, has poorer business been reported in that country. The nearest approach was in 1925 when Canadian roads purchased 10 locomotives.

Locomotives ordered in the United States for export during 1931 totaled 28 or eight more than were purchased here for export during 1930. This compares with 106 ordered for export in 1929 and 27 in 1928.

Locomotives built in 1931 for service in the United States, as distinguished from those ordered, totaled 181 as compared with 972 in 1930 and 926 in 1929. The 1931 production figure is the lowest recorded in Table II which gives statistics back to 1896. Canadian builders, during 1931, built 24 locomotives as compared with 111 in 1930 and 96 in 1929. Locomotives built in the United States for export during 1931 totaled 17 as compared with 51 in 1930 and 139 in 1929.

The distinction between locomotives ordered and the number built should be emphasized. A locomotive is under construction for several months and thus locomotive production figures for any year naturally include some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered.

The Car Service Division of the American Railway Association reports monthly totals of locomotive installations and retirements. These figures will not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

In the appended list of locomotive orders some few omissions of small orders doubtless occur. The details presented were supplied by railways and other purchasers of locomotives in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. Because of the short time available for the compilation and the haste necessary to insure publication so soon after the end of the year, the *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is hoped they meet with entire adequacy.

Table III—Locomotives Built in 1931

	United States	Canada	Total
Domestic	181	24	205
Foreign	17	..	17
Total	198	24	222

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896.....	866	309	1,176	1912†....	4,403	512	4,915
1897.....	865	386	1,251	1913†....	4,561	771	5,332
1898.....	1,321	554	1,875	1914†....	1,962	273	2,235
1899.....	1,951	514	2,475	1915†....	1,250	835	2,035
1900.....	2,648	505	3,153	1916†....	2,708	1,367	4,075
1901.....	....	....	3,384	1917†....	2,585	2,861	5,446
1902.....	....	....	4,070	1918†....	3,668	2,807	6,475
1903.....	....	....	5,152	1919†....	2,162	1,110	3,272
1904.....	....	....	3,441	1920†....	2,022	1,650	3,672
1905*....	4,896	595	5,491	1921†....	1,185	638	1,823
1906*....	6,232	720	6,952	1922†....	1,303	231	1,534
1907*....	6,564	798	7,362	1923†....	3,505	280	3,795
1908*....	1,886	456	2,342	1924†....	1,810	226	2,036
1909*....	2,596	291	2,887	1925†....	994	291	1,285
1910*....	4,441	314	4,755	1926†....	1,585	185	1,770
1911*....	3,143	387	3,530	1927†....	1,009	167	1,176
				1928†....	636	111	747

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

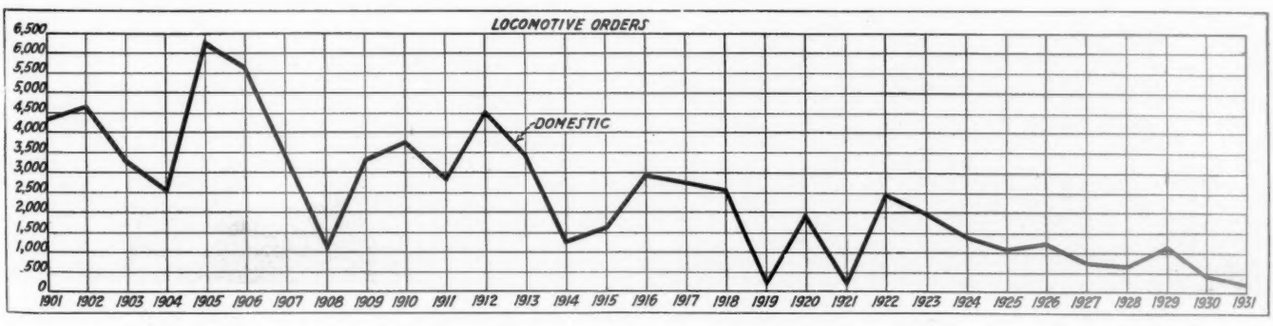
	United States			Canada			Grand
	Domestic	Foreign	Total	Domestic	Foreign	Total	total
1929	926	139	1,065	96	....	96	1,161
1930	972	51	1,023	111	....	111	1,134
1931	181	17	198	24	....	24	222

Locomotive Orders In 1931

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Alaska Railroad	1	4-8-2	Frt.&Pass.	259,000	‡54,900	22 x 30	December	.....	Baldwin
American Sheet & Tin Plate Co.	1	0-4-0	Sw.	112,000	22,100	26 x 24	February	April	Porter
Atchison, Topeka & Santa Fe	*10	Tenders	.....	.....	.....	.....	March	.....	Baldwin
Bangor & Aroostook	2	0-8-0	Sw.	245,000	60,000	25 x 28	July	November	American
Birmingham Rail & Locomotive Co.	1	0-6-0	Sw.	160,000	37,750	22 x 26	1931	May	Baldwin
	1	2-8-0	Freight	121,000	25,500	18 x 24	1931	October	Baldwin
Butler Bros., Inc.	1	0-4-0	Sw.	128,000	28,820	19 x 24	May	May	Baldwin
Central of New Jersey	*5	Tenders	Freight	375,300	.....	.....	May	September	Lima
Chicago & Illinois Midland	2	2-10-2	Freight	405,600	‡88,200	30 x 32	February	April	Lima
	1	2-8-2	Freight	305,000	54,600	26 x 30	February	April	Lima

* Not included in totals.
‡ Tractive force including booster.



Locomotive Orders From 1901 to 1931

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Chic., Milwaukee, St. P. & Pac.	8	4-6-4	Pass.	375,100	45,822	26 x 28	March	October	Baldwin
Delaware & Hudson	1	4-8-0	Freight	.....	.....	.....	October	1932	American
	1	4-6-2	Pass.	296,500	44,250	24 x 32	1931	April	Company Shops
Delaware, Lackawanna & Western	10	4-8-4	Freight	425,000	.....	28 x 32	December	.....	American
Inland Steel Company	2	0-6-0	Sw.	185,000	.....	22 x 28	January	.....	American
Lehigh & New England	1	0-6-0	Sw.	158,550	37,750	22 x 26	May	June	Baldwin
Lehigh Valley	10	4-8-4	Freight	425,000	‡84,400	27 x 30	November	Apr. '32	Baldwin
	10	4-8-4	Freight	426,000	‡85,060	26 x 32	November	Apr. '32	American
Norfolk & Western	*10	Tenders	.....	.....	.....	.....	November	.....	Company Shops
Pennsylvania	*20	Tenders	.....	.....	.....	.....	July	April '32	Company Shops
Philadelphia Gas Works	1	0-4-0	Sw.	117,200	29,600	19 x 24	February	March	Baldwin
Pittsburgh & Ohio Valley	1	0-6-0	Sw.	160,000	37,750	22 x 26	May	May	Baldwin
Tuskegee R. R.	1	2-8-0	Freight	121,000	25,500	18 x 24	July	October	Baldwin
Union Pacific	*20	Tenders	.....	.....	.....	.....	April	August	Baldwin
Western Pacific	6	2-8-8-2	Freight	665,100	‡150,900	26 x 32	March	June	Baldwin

Export

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Amtorg Trading Corp. (Russia)	5	2-10-4	Freight	370,000	.....	27½ x 30	February	September	American
	5	2-10-2	Freight	335,100	55,100	27.6 x 29.9	February	July	Baldwin
Cia. E. de F. Victoria a Minas (Brazil)	1	4-6-2	Pass.	96,700	15,100	15 x 20	March	July	Baldwin
Equitable Equipment Co. (Honduras)	1	2-8-0	Freight	102,000	.....	17 x 22	July	.....	American
Lone Star Cement Co. (Brazil)	2	0-4-0	.....	53,000	.....	12 x 18	December	.....	American
	1	2-6-2	.....	103,000	.....	15 x 20	December	.....	American
F. C. Quito a Esmeraldas (Ecuador)	1	2-8-0	Freight	103,100	22,450	17 x 22	January	April	Baldwin
Southern Persian State Rys.	4	2-6-0	Freight	.....	18,200	16 x 22	November	Jan. '32	Baldwin

Canada

Purchaser	No.	Type	Service	Weight	Tractive Force	Cylinders	Date of order	Date of delivery	Builder
Canadian Pacific	1	2-10-4	Freight	495,300	90,000	{1–15½x 28 / 2–24 x 30}	January	May	Company Shops
	*38	Tenders	Pass.	.....	.....	.....	January	May	Montreal

* Not included in totals.
‡ Tractive force including booster.

Oil-Electric, Gas-Electric or Gasoline Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horse-power	Date of order	Date of delivery	Builder
Albany Port District Comm.	2	0-4-4-0	Sw.	Gas-Elect.	94,500	300	May	August	G.E.-Midwest-Climax
Bush Terminal	7	0-4-4-0	Sw.	Oil-Elect.	114,000	300	March	December	G.E.-Ingersoll Rand
Chicago, Burlington & Quincy	1	0-4-4-0	Sw.	Gas-Elect.	120,000	450	June	December	West.-Whitcomb-Climax
Illinois Terminal	1	0-4-4-0	Sw.	Oil-El.-Bat.	187,000	300	.....	May	G.E.-St. Louis-Buda
Jay St. Connecting R. R.	1	0-4-4-0	Sw.	Oil.-Elect.	178,500	300	August	August	G.E.-Am.-McIntosh
Lehigh Valley	2	0-4-4-0	Sw.	Oil-Elect.	132,000	300	July	December	G.E.-Am.-McIntosh
	1	0-4-4-0	Sw.	Oil-Elect.	125,000	300	July	December	G.E.-Am.-I.R.
	2	0-4-4-0	Sw.	Gas-Elect.	137,300	400	July	August	G.E.-Beth.-Elec.-M.
New York, New Haven & Hartford	1	0-4-4-0	Sw.	Oil-Elect.	.....	600	November	.....	American
Union Pacific	1	0-4-0	Sw.	Gasoline	24,000	100	May	June	Davenport
U. S. Navy	1	.....	...	Gasoline	264,000	...	1931	1931	Porter
Westinghouse E. & M. Co.	1	0-4-0	Sw.	Oil.-Elect.	150,000	400	January	April	Co. Shops-Baldwin

Canada

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horse-power	Date of order	Date of delivery	Builder
Canadian National	1	0-4-4-0	Sw.	Oil.-Elect.	218,000	600	August	1932	Can. G.E.-Co. Shops-I.R.

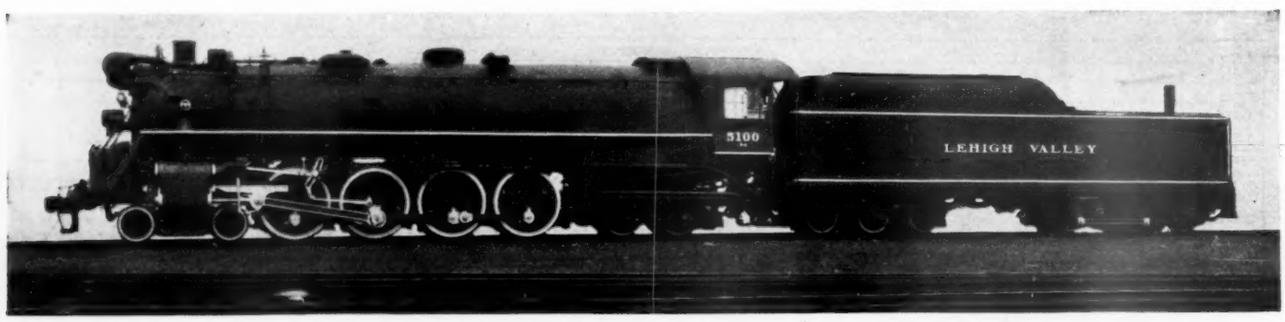
Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horse-power	Date of order	Date of delivery	Builder
Inland Lime & Stone Co.	2	....	Frt.	100,000	1,000	Oct. '30	March	Differential-West.
Pennsylvania	11	4-6-4	Pass.	375,000	3,750	February	1932	Co. Shops-West.
	25	4-6-4	Pass.	375,000	3,750	June	1932	General Electric
	54	4-6-4	Pass.	375,000	3,750	June	1932	Westinghouse
	10	2-8-2	Frt.	330,000	2,500	September	1932	Co. Shops-West.
	30	2-8-2	Frt.	330,000	2,500	September	1932	Lima-G. E.
	20	2-8-2	Frt.	330,000	2,500	September	1932	Westinghouse

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Horse-power	Date of order	Date of delivery	Builder
Amtorg Trading Corp. (Russia)	8	0-6+6-0	Frt.&Pass.	290,000	2,725	February	Jan. '32	General Electric



Lehigh Valley 4-8-4 Type Locomotive Built in March, 1931, by the Baldwin Locomotive Works—Tractive Force 66,400 lb.

Passenger Car Orders in 1931

Decline in all classes of passenger traffic forces buying down to lowest point since 1918—Canadian orders also below average

By Gardner C. Hudson
Associate Editor, Railway Age

Interior of Pullman's Latest Air-Conditioned Car

REFLECTING the decrease in passenger traffic, which continued in accentuated measure during the year—partly, at least, as a result of the prevailing economic depression—orders placed in the United States for passenger-train cars in 1931 numbered only 11. This figure, however, includes neither Canadian orders nor orders placed in this country for cars to be used abroad; nor does it include orders for rail motor cars, which are considered in an article appearing elsewhere in this issue of *Railway Age*.

The unusually low total of 11 cars ordered not only ranks 1931 as the poorest year since 1918, when only nine were purchased, but also as the second poorest since 1901; while it compares with a 1930 figure of 667, and with average orders, in each of the eight years just prior to 1930, for more than 2,000 cars. The sudden slump in passenger-train car buying, moreover, affected all classes of passenger-train equipment—coaches, Pullman cars, and mail, baggage and express cars, which, since they are generally hauled in passenger trains, are counted as passenger cars for the purpose of compiling statistics relative to car orders; while responsibility for the slump was shared by all classes of passenger-train traffic.

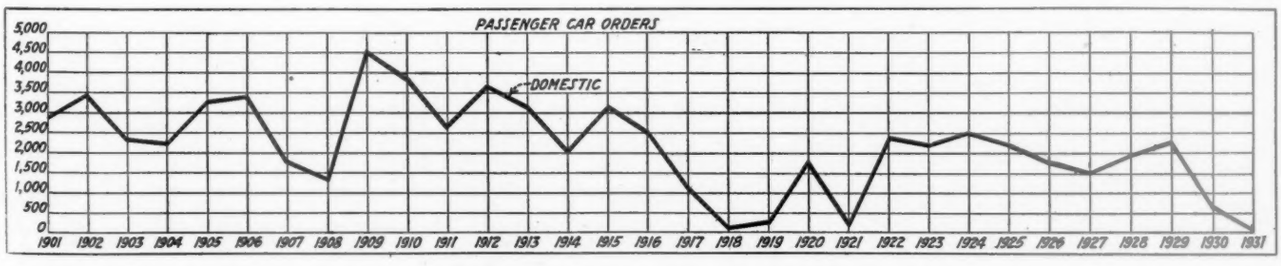
Table I—Passenger Car Orders of 1931

For service in the United States	11
For service in Canada	11
For export to other countries	21
Grand total	43

Passenger revenues of Class I railroads, which have dropped steadily from a total of $1,287,423,443 in 1920 to $729,635,768 in 1930, suffered a further decrease in 1931, falling to $474,577,319 for the first 10 months, a figure which was approximately $150,000,000 less than that for the first 10 months of 1930. This general decline was accompanied by a falling off in Pullman traffic, with the result that the Pullman Company considerably curtailed its orders for new equipment, buying one sleeping car in 1931, in sharp contrast to its orders for totals of 94 and 557 cars in 1930 and 1929, respectively. "Head-end" traffic also revealed the effects of the current depression, mail revenues of Class I roads declining from $91,149,387 in 10 months of 1930 to $86,488,948 in the corresponding part of 1931, and express revenues falling from $97,251,696 to $71,556,889 over the same two periods.

As in 1918, and for the first time since that year, orders placed in this country for cars to be exported exceeded orders placed for cars for domestic use, 21 passenger-train cars of various types being purchased from the Pullman Car & Manufacturing Corporation by the Rio Grande do Sul of Brazil. The year's total, represented by this one contract, is below the general average of export orders for the 15 previous years, but is higher than the totals for 1922, 1923 and 1930.

Like those placed by railroads of the United States, passenger-train car orders in Canada in 1931 also totaled 11, six of the cars being purchased by the Canadian Pacific and five by the Canadian National. This figure compares with 203 cars ordered in Canada last year



Passenger Car Orders From 1901 to 1931

and with 122 purchased in 1929, and is even lower than the total for 1918, when 22 passenger cars were ordered.

Production reports show that the total number of passenger-train cars built in the United States and Canada during 1931 was 285, against 1,514 built last year. Of the 1931 total, 198 cars were built in the United States for domestic use, 21 in the United States for export and 66 in Canada for Canadian use. A similar analysis of the 1930 totals shows figures of 1,264, 40 and 210. Production for domestic use in this country was the lowest on record; production for export was the lowest since 1929, and production in Canada was the lowest reported since 1925. The fact that 1931 production figures are higher than those for 1931 orders is accounted for by the fact that construction of all cars contracted for in any given year is not necessarily completed during that year, i.e., some of the cars reported as ordered in 1930 were not finished by the end of that year and are, therefore, included in 1931 production.

Looking to the future, it seems probable that the decline in all types of passenger-train traffic experienced during 1931 is due largely to the depression, and is only in smaller degree a continuance of the downward trend of the past decade. Should this be so, at least a slight upturn in passenger revenues may be expected to follow any revival in general business, while it is equally fair to assume that any such revival would stimulate the buying of passenger equipment. New developments in passenger-car design and construction, and particularly the perfection of various methods of air-conditioning, have tended to increase passenger comfort and thus, under normal business conditions, should aid the roads to hold or to increase their passenger traffic, with a consequent stimulus to passenger car buying.

Table II—Orders for Passenger Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162
1927	1,612	143	48	1,803
1928	1,930	334	29	2,293
1929	2,303	122	33	2,458
1930	667	203	15	885
1931	11	11	21	43

Table III—Passenger Cars Built in 1931

	United States	Canada	Total
Domestic	198	66	264
Foreign	21	...	21
	219	66	285

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

	United States			Canadian			Grand
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	total
1913	2,559	220	2,779	517	....	517	3,296
1914	3,310	56	3,366	325	....	325	3,691
1915	1,852	14	1,866	83	....	83	1,949
1916	1,732	70	1,802	37	....	37	1,839
1917	1.924	31	1,955	45	....	45	2,000
1918	1,480	92	1,572	1	....	1	1,503
1919	306	85	391	160	....	160	551
1920	1,272	168	1,440	....	....	....	....
1921	1,275	39	1,314	361	....	361	1,675
1922	676	144	820	71	....	71	891
1923	1,507	29	1,536	....	....	....	....
1924	2,150	63	2,213	167	....	167	2,380
1925	2,363	50	2,413	....	....	....	....
1926	2,184	102	2,286	285	....	285	2,571
1927	1,785	50	1,835	126	....	126	1,961
1928	1,356	15	1,371	237	....	237	1,608
1929	1,254	20	1,274	162	....	162	1,436
1930	1,264	40	1,304	210	....	210	1,514
1931	198	21	219	66	....	66	285

Passenger Car Orders in 1931

For Service in the United States

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Chic., Milwaukee, St. P. & Pac.	2	Mail & Exp.	.....		..	.....	1931	1931	Company Shops
Hutton, Franklyn L.	1	Private	85	10	..	197,000	January	May '32	Am. Car & Fdy.
Kansas City Southern	1	Mail, B. & Exp.	73	9½	..	143,800	May	September	Pullman
	1	Mail, B. & Exp.	73	9½	..	140,880	May	September	Pullman
	1	Mail, B. & Exp.	73	9½	..	141,300	May	August	Pullman
	1	Mail, B. & Exp.	73	9½	..	142,100	May	September	Pullman
Long Island	†1	Coach	59	4	120	.....	October	1932	P. R. R. Shops
Pullman Company	1	Sleeping	.....		..	.....	1931	.....	Pullman
St. Louis-San Francisco	2	.....	.....		..	.....	1931	1931	Company Shops

† Aluminum.

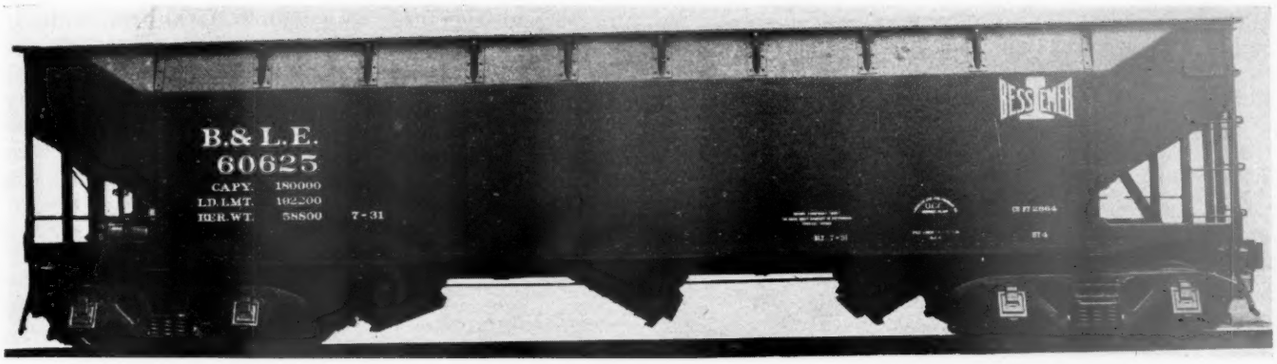
Export

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
National Rys. of Mexico	*2	.....	.....		..	.....	1931	1931	Company Shops
	*3	.....	.....		..	.....	1931	1931	Company Shops
Rio Grande Do Sul (Brazil)	4	Dining	57	2⅜	28	64,700	March	.....	Pullman
	5	Sleeping	57	1	14	65,900	March	.....	Pullman
	6	Coach	57	1	40	61,000	March	.....	Pullman
	6	Mail & Bagg.	57	2⅜	..	58,700	March	.....	Pullman

* Not included in totals.

Canada

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Canadian National	3	Cafe-Parlor	84	10½	31	176,200	May	November	Can. Car & Fdy.
	2	Sleeping	84	7½	36	177,200	May	October	Can. Car & Fdy.
Canadian Pacific	3	Parlor-Lounge	78	0½	27	176,200	January	September	Company Shops
	3	Cpt.-Lounge	78	0½	36	186,300	January	December	Company Shops



Bessemer & Lake Erie 90-Ton Hopper Built by American Car & Foundry

Freight Cars Ordered in 1931

Domestic total of 10,880 sets new low record—Canadian orders for 3,807 above total for 1930

By F. W. Kraeger

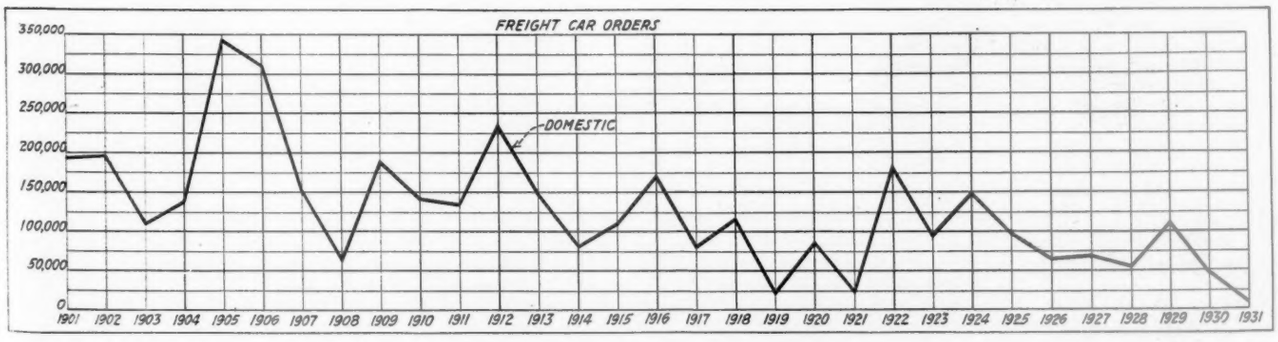
Associate Editor, Railway Age

READERS of the *Railway Age*, being generally familiar with the depressed state of railroad traffic and earnings during the past year, will not be surprised to learn that fewer freight cars were ordered in 1931 for domestic service in the United States than in any other year recorded in the accompanying tables which are continuous back to 1901. The total—10,880—is less than one-quarter the number ordered in 1930, and is only one-tenth of the 1929 business which involved the purchase of 111,218 cars. Furthermore, it represents just about half the business done in 1919 when the previous low point was reached with orders for 22,062 cars.

A somewhat brighter picture is gleaned from the statistics of freight car orders placed by Canadian railways with builders in that country. The 1931 total of these latter was 3,807, or nearly double the 1930 figure of 1,936. In 1929 Canadian roads ordered 9,899 freight cars and in 1928 they purchased 8,901. Despite the unfavorable comparison with these two years, however, the 1931 total is larger than that of any of the five other years since 1923. It has, in fact, been exceeded in only six of the past 14 years which represent the period during which Canadian orders have been segregated in Table II.

Freight cars ordered in the United States for export during 1931, following the downward trend noted in domestic orders, totaled only 151 and thus set a new low record at only 40 per cent of the previous low established in 1923, when export orders for 396 freight cars were placed. During 1930 a total of 1,200 cars were ordered for export while in 1929 and 1928 respectively 3,023 and 2,530 were ordered. Since the abnormal war years when these export orders crossed the 50,000 mark they have fallen below 1,000 in only three years. They have averaged over 1,700 cars per year for the past decade so the 1931 total of 151 is less than 10 per cent of the 10-year average.

Freight car production figures for 1931 also set new low records. The total built last year for service in the United States was 13,205 as compared with 75,188 in 1930 and 82,240 in 1929. The 1931 figure represents production of less than one-third the number of cars built in 1921, the previous low year. In Canada 4,633 freight cars were built in 1931 as compared with 6,923 in 1930 and 8,557 in 1929. Production in the United



Freight Car Orders 1901 to 1931

States for export during the past year involved the building of 409 cars; this is also a new low record and compares with the previous low of 462 in 1914 and with respective 1930 and 1929 figures of 1,909 and 3,168.

The foregoing production figures should not be confused with the totals of orders placed. Nor should they be compared with the figures on the number of cars installed as reported in the statistics issued monthly by the Car Service Division of the American Railway Association. This latter includes only installations on Class I roads, whereas *Railway Age* figures include the production of all cars for the railroads as well as private car lines.

As indicated at the outset the explanation of the poor business accruing to car builders during 1931 is to be found in the statistics of railway traffic and earnings. Car loadings which averaged over a million a week in 1929 did not cross the 800,000 mark for any week of 1931. With such a traffic decline the freight car surplus reached proportions approaching each week the total of cars loaded. During the first half of the year the surplus averaged more than 600,000 cars, while it was consistently above the half-million mark for the remaining six months. During the last week of November, for example, 558,807 cars of revenue freight were loaded while the freight car surplus was reported as 659,346 cars. In such a set of circumstances, with traffic demands for only slightly more than half the available number of cars, it was hardly to be expected that freight car buying motives would become very compelling.

The appended tables contain a detailed statement of orders placed for new freight cars or those having new bodies, with builders during 1931 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this information. The data thus

Table I—Freight Car Orders in 1931

For service in the United States	10,880
For service in Canada	3,807
For export to other countries	151
Grand total	14,838

Table II—Orders for Freight Cars Since 1901

Domestic Orders

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	103,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785
1928	51,200	8,901	2,530	62,631
1929	111,218	9,899	3,023	124,140
1930	46,360	1,936	1,200	49,496
1931	10,880	3,807	151	14,838

Prior to 1918, Canadian orders included in domestic.

Table III—Freight Cars Built in 1931

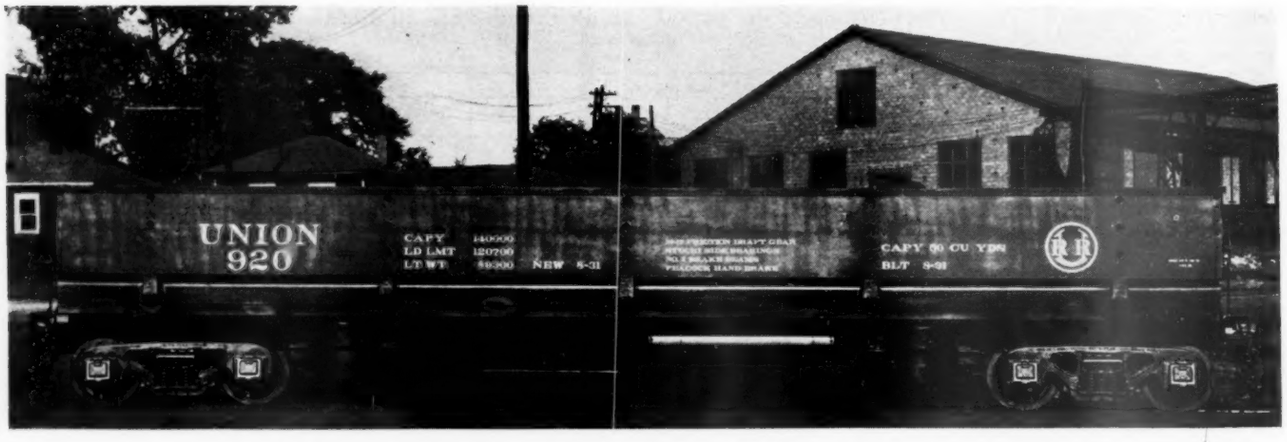
	United States	Canada	Total
Domestic	13,205	4,633	17,838
Foreign	409	....	409
Total	13,614	4,633	18,247

Comparison with Previous Years

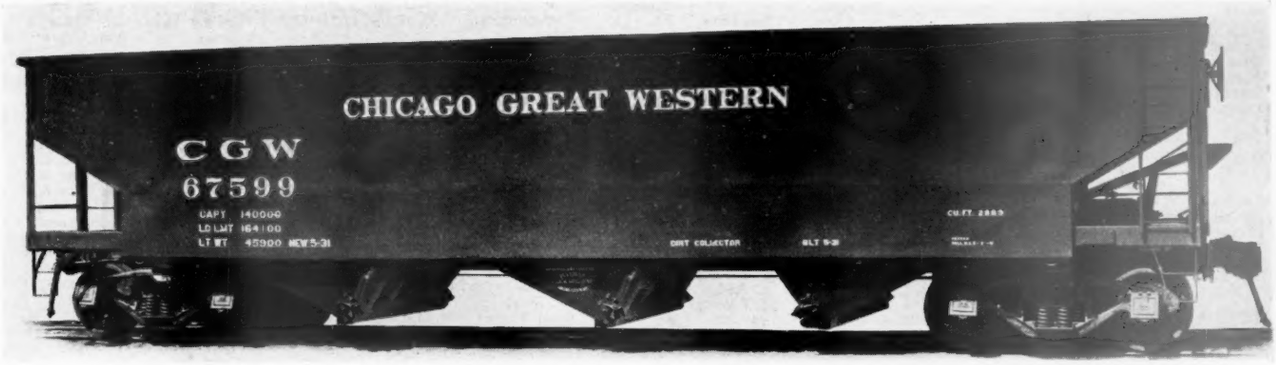
Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886
1900	113,070	2,561	115,631
1901	132,591	4,359	136,950
1902	161,747	2,800	162,599
1903	153,195	1,613	152,801
1904	60,955	1,995	60,806
1905*	162,701	5,305	165,155
1906*	236,451	7,219	240,503
1907*	280,216	9,429	284,188
1908*	75,344	1,211	76,555
1909*	91,077	2,493	93,570
1910*	176,374	4,571	180,945
1911*	68,961	3,200	72,161
1912†	148,357	4,072	152,429

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

Year	United States Domestic	United States Foreign	United States Total	Canadian Domestic	Canadian Foreign	Canadian Total	Grand total
1913.....	176,049	9,618	185,667	22,017	....	22,017	207,684
1914.....	97,626	462	98,088	6,453	....	6,453	104,451
1915.....	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916.....	111,516	17,905	129,421	....	....	5,580	135,001
1917.....	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918.....	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919.....	94,981	61,783	156,764	6,391	30	6,421	163,185
1920.....	60,955	14,480	75,435	....	....	....	....
1921.....	40,292	6,412	46,704	8,404	745	9,149	55,853
1922.....	66,289	1,126	67,415	458	100	558	67,973
1923.....	175,748	2,418	178,166	....	....	....	....
1924.....	113,761	1,141	114,902	1,721	....	1,721	116,623
1925.....	105,935	3,010	108,945	....	....	....	....
1926.....	88,862	2,771	91,633	1,645	....	1,645	93,278
1927.....	63,390	1,087	64,477	2,851	....	2,851	67,328
1928.....	46,060	938	46,998	5,158	....	5,158	52,156
1929.....	82,240	3,168	85,408	8,557	....	8,557	93,965
1930.....	75,188	1,909	77,097	6,923	....	6,923	84,020
1931.....	13,205	409	13,614	4,633	....	4,633	18,247



Union 50-Yard Dump Car Built for the Differential Steel Car Company by Greenville



All-Welded Hopper Built for the Chicago Great Western by Pullman Car & Manufacturing Corporation

furnished were then checked against list of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years the *Railway Age* is especially indebted to the American Railway Car Institute in securing the reports of the companies affiliated with that organization.

The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. It feels that such accuracy would be next to impossible, in view of the short space of time permitted for the compilations due to the desirability of having the results available at the close of the year with which they deal. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly as concerns comparison with preceding years which, after all, is the primary purpose of the compilations.

Freight Car Orders in 1931

For Service in the United States

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Alcoa Ore Co.	10	Hopper	140,000	40	0	Aluminum	38,900	September	December	Canton Car
	15	Hopper	140,000	40	0	Steel	60,100	September	November	Canton Car
American R. R. of Porto Rico	200	Cane	.....	.....		Steel	.....	July	.....	Gregg
Atchison, Topeka & Santa Fe	10	Drovers	.....	.....		....	.....	1931	1931	Company Shops
Atlanta & West Point and Western Ry. of Alabama	4	Caboose	60,000	32	4	Steel	61,200	.....	April	Company Shops
Belle Alkali Co.	1	Tank	30,000	42	2¾	Steel	33,400	May	July	Am. Car & Fdy.
Bessemer & Lake Erie	350	Hopper	180,000	40	5	Steel	58,950	March	July	Am. Car & Fdy.
	300	Hopper	180,000	40	5	Steel	58,950	March	July	Standard Steel
	300	Hopper	180,000	40	5	Steel	58,950	March	July	Pressed Steel
	100	Hopper	180,000	40	5	Steel	58,950	March	July	Greenville St.
Board of Transportation, New York City	6	Flat	60,000	40	10¾	Steel Frame	37,300	May	November	Magor
	6	Dump	60,000	44	11	Steel	72,700	May	November	Magor
	2	Motor Flat	34,000	44	7½	Steel Frame	87,000	May	November	Magor
	1	Supply	40,000	33	0	Steel	41,000	May	November	Magor
	1	Pump	.....	47	8	Steel	66,000	May	November	Magor
Boston & Maine	25	Caboose	.....	.....		Steel	.....	November	.....	Company Shops
Brown Company	2	Tank	30,000	42	2¾	Steel	33,400	January	February	Am. Car & Fdy.
Byllesby Engrg. & Mgt. Corp.	2	H. S. Gondola	100,000	41	6	Steel	49,700	March	July	Gen. Amer. Car
Canton Tank Car Co.	2	Tank	8,000g.	31	6	Steel	41,000	March	May	Am. Car & Fdy.
	13	Tank	8,000g.	31	6	Steel	40,800	September	November	Am. Car & Fdy.
	2	Tank	6,000g.	27	6	Steel	37,600	September	November	Am. Car & Fdy.
Carey Co., Thomas F.	10	Hopper	110,000	32	0	Steel	40,200	September	September	Standard Steel
Carnegie Steel Co.	30	Gondola	100,000	40	2	Steel	54,500	July	October	Greenville St.
Chesapeake & Ohio	5	Gondola	100,000	40	6	Steel	43,200	July	September	Am. Car & Fdy.
Chicago & Illinois Midland	4	Caboose	.....	27	5⅜	St. Und'frame	40,400	July	November	Pullman
	500	Gondola	100,000	41	6	Steel Frame	40,500	October	Feb. '32	Pullman
	250	Hopper	100,000	34	9	Steel	47,700	October	Feb. '32	Pullman
Chicago Great Western	500	D. S. Box	100,000	40	6	Steel	45,400	June	Aug.-Sept.	Pullman
Chic., Milwaukee, St. P. & Pac.	4	Dump	20 cu. yd.	.....		....	.....	April	May	W. Wh. Scraper
City of Chicago	1	Hopper	100,000	40	0	Steel	44,000	September	November	Mt. Vernon Car
Cleveland-Electric Illuminating Co.	2	Hopper	140,000	42	3	Steel	54,000	May	July	Bethlehem
Coatesville Boiler Wks.	1	Flat	80,000	40	0	Steel Frame	32,900	June	July	Standard Steel
Continental Oil Co.	30	Tank	6,200g.	32	4	Steel	37,000	September	December	Pressed Steel
Delaware & Hudson	100	S. S. Box	80,000	40	6	Steel Frame	44,500	January	December	Company Shops
	1	Hopper	110,000	34	0	Steel Frame	43,300	January	February	Company Shops
	349	Hopper	85,000	32	5⅝	Steel Frame	38,700	January	Jan. '32	Company Shops
Delaware, Lackawanna & Western	25	Air Dump	100,000	34	6	Steel	67,300	March	May	Magor
	10	Air Dump	100,000	32	6	Steel	70,500	March	April	Koppel
Diamond Alkali Co.	2	Tank	30,000	42	2¾	Steel	31,900	October	October	Am. Car & Fdy.
duPont de Nemours & Co., E. I.	1	Tank	50,000	.....		....	.....	September	.....	Gen. Amer. Tank
East Jersey R. R. & Terminal Co.	16	Tank	6,000g.	33	0	Steel	36,000	April	May	Am. Car & Fdy.
	1	Tank	4,500g.	33	0	Steel	33,000	April	May	Am. Car & Fdy.
Electro Bleach. Gas Co.	3	Tank	60,000	30	0	Steel	60,800	August	September	Am. Car & Fdy.
Elgin, Joliet & Eastern	240	.....	.....	.....		....	.....	1931	1931	Company Shops
Emery, A. H. & Co.	1	Sc. Test Car	140,000	40	5⅝	Steel	64,000	February	June	Am. Car & Fdy.
Erie	1	Dump	30 cu. yd.	34	0	Steel	69,000	May	May	Koppel
Ethyl Gasoline Corp.	3	Tank	3,000g.	26	10¼	Steel	41,000	April	June	Am. Car & Fdy.
Fisher Lumber Corp.	20	Logging	60,000	20	0	Wood	15,800	March	May	Am. Car & Fdy.
Fleischmann Transportation Co.	†33	Tank	.....	.....		St. Und'frame	.....	1931	1931	Company Shops
	3	Tank	8,000g.	.....		Steel	.....	1931	1931	Company Shops
Freedom Oil Works Co.	7	Tank	.....	.....		....	.....	February	.....	Standard Tank
Fruit Growers' Express	21	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	February	August	Company Shops
	317	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	June	August	Company Shops
	350	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	June	September	Company Shops
	97	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	June	October	Company Shops
Gen. American Transp. System	250	Refrigerator	.....	.....		....	.....	June	October	Gen. Amer. Car

† Wooden tank.

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
General Chemical Co.	15	Tank Bod.	38,000	29	1	Steel	13,000	April	June	Am. Car & Fdy.
Great Northern	500	Hopper	100,000	34	9	Steel	46,100	April	September	Standard Steel
Hauser Construction Co.	8	Air Dump	.....	22	6	Steel	55,000	March	April	Magor
Hercules Powder Co., Inc.	3	Tank	.....	39	4	Steel	73,000	June	August	Am. Car & Fdy.
Inland Lime & Stone Co.	14	Air Dump	100,000	32	6	Steel Frame	68,500	Dec. '30	February	Koppel
	4	Air Dump	100,000	34	6	Steel	66,700	January	April	W. Wh. Scraper
Inland Steel Co.	15	Ingot	.....	.....		....	.....	February	.....	Lorain Steel
Koppers Company	100	Hopper	100,000	29	9	Steel	38,700	March	Aug.-Sept.	Canton Car
L. C. L. Corp.	50	Container	110,000	47	11	Steel	53,800	March	July	Am. Car & Fdy.
	225	Container	110,000	47	11	Steel	54,200	July	November	Am. Car & Fdy.
Litchfield & Madison	4	Caboose	.....	29	4⅜	Steel Frame	39,300	August	October	Am. Car & Fdy.
Merchants Despatch, Inc.	1,000	Refrigerator	70,000	33	2	Steel Frame	57,500	February	June-Nov.	M.D.Transp. Co.
Minneapolis & St. Louis	100	Flat	100,000	50	0	Steel	42,500	March	July	Gen. Amer. Car
Mobile & Ohio	2	.....	.....	.....		....	.....	1931	1931	Company Shops
Monsanto Chemical Wks.	7	Tank	9,800g.	31	9¾	Steel	55,500	November	December	Am. Car & Fdy.
	2	Tank	5,000g.	28	0	Steel	38,560	November	December	Am. Car & Fdy.
	1	Tank	7,000g.	27	6	Steel	40,960	November	December	Am. Car & Fdy.
	1	Tank	7,000g.	27	5	Steel	44,440	November	December	Am. Car & Fdy.
New York Central	300	Gondola	140,000	65	6	Steel Frame	64,000	August	November	Company Shops
Norfolk & Western	500	Hopper Bod.	115,000	30	0½	Steel	42,000	February	May-Oct.	Company Shops
	450	Hopper Bod.	115,000	30	0½	Steel	42,000	June	Oct.-Mar.'32	Company Shops
North Western Refrigerator Line	220	Refrigerator	80,000	40	0	Steel Frame	56,000	May	September	Am. Car & Fdy.
Northern Pacific	500	D. S. Box	80,000	40	9	St. Und'frame	46,000	January	.....	Company Shops
	500	Stock	80,000	40	6	St. Und'frame	43,800	March	.....	Company Shops
	500	S. S. Box	100,000	40	9	Steel Frame	48,800	May	.....	Company Shops
	500	S. S. Box	80,000	40	9	Steel Frame	45,600	August	.....	Company Shops
Oregon-Washington R. R. & Nav. Co.	6	Air Dump	30 cu. yd.	33	9	Steel	76,000	April	May	Differential
Pennsylvania Salt Mfg. Co.	2	Tank	30,000	42	2¾	Steel	33,400	April	May	Am. Car & Fdy.
Pittsburgh & Lake Erie	200	Gondola	140,000	65	6	Steel Frame	64,000	August	November	M.D.Transp. Co.
Porter Gildersleeve Corp.	20	Gondola	100,000	39	8¾	St. Und'frame	51,200	March	April	Koppel
	5	H. S. Gondola	100,000	38	6¾	St. Und'frame	51,700	September	November	Koppel
St. Louis-San Francisco	10	.....	.....	.....		....	.....	1931	1931	Company Shops
St. Paul Bridge & Terminal	100	D. D. Stock	80,000	40	0	Steel Frame	43,800	July	September	Gen. Amer. Car
	150	S. D. Stock	80,000	40	0	Steel Frame	43,900	July	October	Gen. Amer. Car
Sheffield Farms Co.	9	Tank Refrig.	100,000	40	9	Steel	90,000	March	April	G.A.-Pfaudler
Shell Oil Company	50	Tank	100,000	.....		Steel	40,000	April	June	Gen. Amer. Tank
Shippers' Car Line	1	Tank	5,000g.	32	3	Steel	48,800	February	April	Am. Car & Fdy.
	1	Tank	8,000g.	31	6	Steel	41,900	June	July	Am. Car & Fdy.
	1	Tank	6,000g.	27	6	Steel	43,900	August	October	Am. Car & Fdy.
Stauffer Chemical Co.	1	Tank	6,400g.	29	3	Steel	39,600	February	March	Am. Car & Fdy.
Struthers Wells-Titusville Corp.	2	Tank	7,000g.	31	9	Steel	43,400	July	December	Am. Car & Fdy.
Taylor Chemical Corp.	1	Tank	7,000g.	27	6	Steel	40,700	June	July	Am. Car & Fdy.
Tennessee Coal, Iron & R. R. Co.	4	Flat	140,000	40	0	Steel	53,600	1931	.....	Pullman
	4	Transfer	140,000	40	0	Steel	59,200	1931	.....	Pullman
Thunder Bay Quarries Co.	6	Air Dump	100,000	25	3	Steel Frame	64,500	March	June	Koppel
Union Pacific	1	Plow	60,000	30	9½	St. Und'frame	31,000	March	May	Am. Car & Fdy.
Union Railroad	10	Air Dump	140,000	46	0	Steel	89,700	April	October	Differential
	10	Air Dump	140,000	46	0	Steel	92,800	April	November	Magor
Union Tank Car Co.	2	Tank	80,000	36	8½	Steel	34,700	September	November	Gen. Amer. Tank
	10	Tank	100,000	40	5	Steel	72,600	April	June	Am. Car & Fdy.
	27	Tank	100,000	42	11	Steel	86,200	April	June	Am. Car & Fdy.
	100	Tank Bod.	6,500g.	.....		Steel	.....	July	.....	Graver Tank & Mfg. Corp.
U. S. Industrial Alcohol Co.	4	Tank Bod.	.....	.....		....	.....	.....	.....	Gen. Amer. Tank
U. S. Navy	1	Flat	60,000	55	0	Steel	38,500	August	October	Koppel
	8	Flat Bod.	80,000	37	6	St. Und'frame	27,000	October	December	Magor
	6	Tank	.....	.....		Steel	.....	July	.....	Gen. Amer. Tank
	3	Flat	80,000	.....		....	.....	November	.....	Haffner-Thrall
United Verde Copper Co.	4	Air Dump	.....	.....		....	.....	May	.....	W. Wh. Scraper
Western Fruit Express	40	Refrigerator	125,000	42	6	St. Und'frame	84,000	1930	January	Company Shops
	1	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	February	July	Company Shops
	10	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	February	August	Company Shops
	8	Refrigerator	75,000	33	2¾	St. Und'frame	56,200	June	August	Company Shops
White Star Refining Co.	1	Tank	10,000g.	31	6	Steel	45,800	July	August	Am. Car & Fdy.

Export

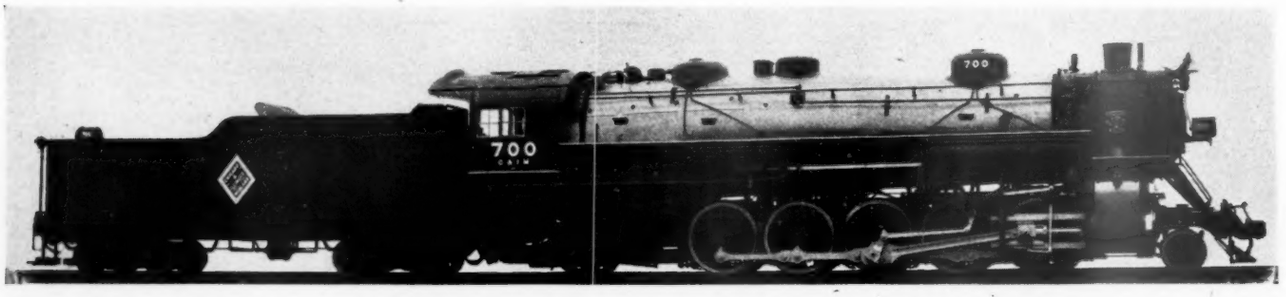
Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Amtorg Trading Corp. (Russia)	85	Air Dump	30 cu. yd.	33	6	Steel	140,000	April	June-Aug.	Magor
	5	Air Dump	30 cu. yd.	.....		Steel	.....	August	October	W. Wh. Scraper
Mexican Railway	*4	Caboose	.....	.....		....	.....	1931	1931	Company Shops
	*2	.....	.....	.....		....	.....	1931	1931	Company Shops
National Rys. of Mexico	*75	.....	.....	.....		....	.....	1931	1931	Company Shops
	*17	.....	.....	.....		....	.....	1931	1931	Company Shops
Pan.-Amer. Pet. & Transp. Co.	7	Tank	9,725g.	34	10	Steel	56,000	October	December	Standard Steel
Southern Persian State Rys.	50	Ballast	66,000	35	0	Composite	27,416	November	Jan. '32	Magor
Standard Oil Co. of N. J.	4	Tank	4,500g.	.....		....	.....	May	.....	Magor

* Not included in totals.

Canada

Purchaser	No.	Class	Capacity	Length Ft.	Length In.	Construction	Weight	Date of Order	Date of Delivery	Builder
Canadian National	1,700	S. S. Box	120,000	40	6	Steel Frame	44,800	January	March-June	Can. Car & Fdy.
	1,100	Box	120,000	40	6	Steel Frame	44,800	January	April-June	National Steel
	500	D. E. Gondola	150,000	48	6	Steel Frame	57,000	January	March-May	Eastern Car
	500	Gen. Serv.	115,000	41	6	Steel Frame	49,700	January	May-July	Eastern Car
Thurso & Nation Valley	7	.....	.....	.....		....	.....	1931	1931	Company Shops

* * * *



Chicago & Illinois Midland 2-10-2 Type Locomotive Built by the Lima Locomotive Works, Inc.—Tractive Force, 77,700 lb.—Equipped With Franklin Booster With Tractive Force of 10,500 lb.

Decline in Market and Dividend Fall Reflect

RAILWAY FINANCES IN 1931

By J. G. Lyne
Financial Editor
Railway Age

Several receiverships in year—Others threaten unless remedies are applied quickly—Real trouble deeply seated

THE stock market during the past year, no one needs to be told, has not failed to place the gloomiest interpretation possible upon dwindling railway traffic and revenues. How satisfactory a barometer of coming business conditions the market is may be judged by its action in 1929, and railroad men need not regard the low estimate it places on their industry in its figures today as of essentially greater significance than its gross exaggeration of the future in the prices attained in the autumn of 1929. Nevertheless the figures do have an importance in that they reflect the attitude of investors and, when this attitude is unfavorable, it means that new funds needed for refinancing and for improvements will not be forthcoming. Moreover, the comparatively higher regard of the market for securities of corporations other than railroads has its significance.

A gloomy attitude on the part of the investing public is particularly disturbing when it includes not only stocks but bonds as well. The situation with regard to bonds was not particularly unfavorable at the beginning of 1931. Average prices, as shown in the *Railway Age* index of twenty representative issues, ranged upwards of 93 in January, February and March. In April and May they eased off slightly, but held steadily above 91. In June and July they ranged but little lower. But by August an earnest decline set in, which remained almost constant up to the middle of December, when the average reached a low point of 60, a shrinkage in values of more than a third in the course of the year—a condition which can only be described as a panic.

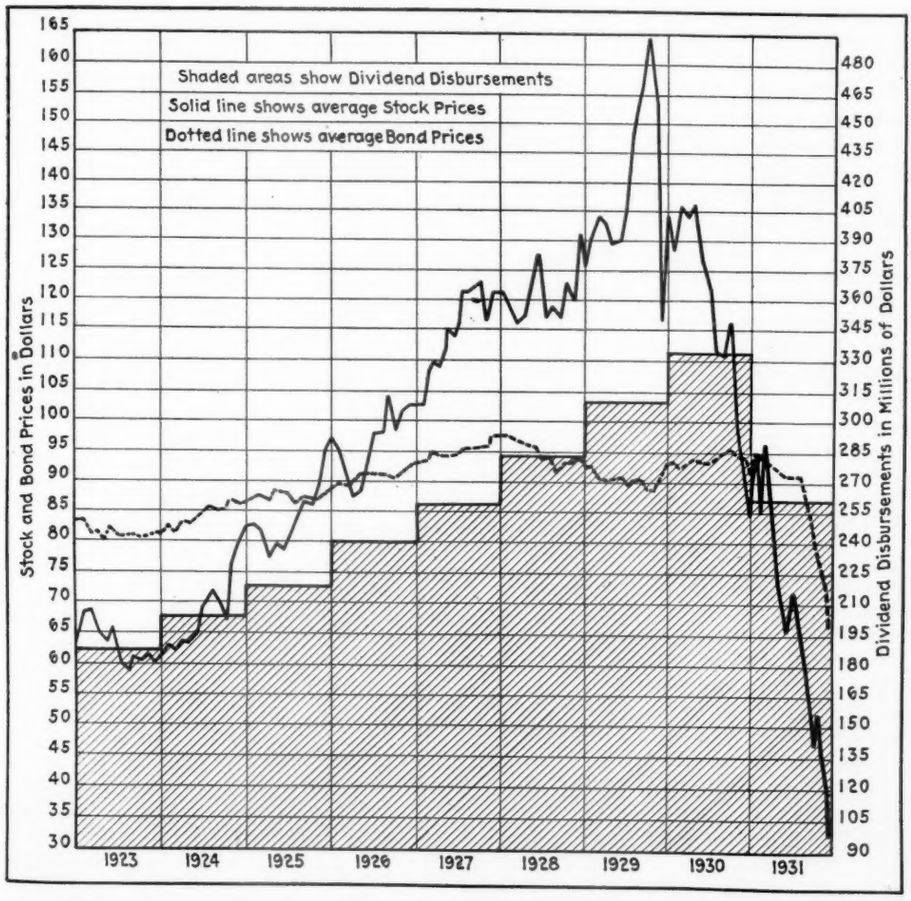


Chart A—Average Prices of Stocks and Bonds of Twenty Leading Railroads, With Dividend Disbursements Shown on the Same Relative Scale

1931 Dividend Payments Estimated.

Stock prices, according to the *Railway Age* index of twenty representative issues, started the year slightly above 90, had their ups and downs during the first two months and closed February at above 96, the high point for the year. In March, April and May there was a steady downward movement, until the average of 56 was reached early in June. There was then a rally which carried the average to almost 73 by the end of June. In July a downward movement set in, which continued throughout August and was accelerated in September, after which the same panicky selling of stock took place as was the case with bonds, and the index by the middle of December touched a new low which was less than 31. The

Chart B—Fluctuations in the Average Price of Twenty Leading Railroad Stocks and Twenty Leading Railroad Bonds in 1931

depreciation in market values of stocks, thus, was about two-thirds during the year.

Naturally there was not a heavy volume of financing during such a period. No stock issues at all were forthcoming and bond issues were confined to the early part of the year before prices went to pieces. There was little demand for equipment trust financing and, when it was undertaken, the issues were, in large measure, not sold but offered as security for short term notes. Necessary financing has been taken care of largely in latter months by short term obligations, with bonds substantially in excess of the advances deposited as collateral. Refinancing to meet maturities promises to be very embarrassing unless some such organization as the Reconstruction Finance Corporation advocated by the President is set up to provide needed funds through government credit while private credit is so timorous. President Willard of the Baltimore & Ohio testified before the Senate committee on Interstate Commerce that the railroads will have approximately one billion dollars of refinancing to do in the next three years, inclusive of short term notes.

Receiverships were another unpleasant feature of the year, the largest of these being those of the Wabash, the Ann Arbor and the Florida East Coast. The plan for pooling the proceeds of the rate advance permitted by the Interstate Commerce Commission, with loans from the pool to be advanced to roads in need to meet bond interest, should serve to avoid this eventuality for a number of roads which, in the absence of some such relief, are headed definitely in that direction.

It should be remarked in passing, however, that such steps as the pooling plan and the Reconstruction Credit Corporation are only palliatives—febrifuges which are a necessity at the climax of a disease, but which are not a cure for the disease itself, which in this case was plainly brought on by undernourishment—starvation, arising from inadequate rates, regulation to the point of strangulation and artificial stimulation of competitors by subsidies out of the pockets of the taxpayers. If there is any danger in the railroad situation today which is not obvious to all, it is that attention may be diverted by the discussion of necessary immediate palliative measures from any proper consideration of and action on the fundamental causes which lie behind the present crisis.

The Dow-Jones average prices of railroad stocks afford an opportunity for comparing them with average prices of industrial stocks, for which there is also a Dow-Jones index. The lowest average price of railway stocks on this index prior to the present depression was reached in April, 1897, when it stood at 48.12. A new low point was reached on October 5, 1931, when the index dropped to 45.68. The figure then rose for several weeks, but fell again with the first decision of the Interstate Commerce Commission in the 15 Per Cent rate case until, on December 17 a new low of 32.52 was reached. On the same date the average price of industrial stocks as reflected in this index stood 15 per cent higher than the lowest reached in the depression of 1921, whereas railroad stocks were 50 per cent lower than the 1921 low point. Although it may be granted that the stock market figures are no just barometer of what lies ahead for business in general, no such question attaches to their relative estimate regarding comparative prospects of different industries. From this point of view, then, the stock market thinks at least 15 per cent better of other industries' prospects than it did of them in 1921, whereas never has it looked upon the railway situation with greater gloom.

Palliatives are necessary, but the story of the figures suggests strongly that nothing short of going to the very seat of the disease will afford the needed relief.

Chart A shows the *Railway Age* average of stock and bond prices during the past nine years, with dividend disbursements of these companies for these years plotted on the same relative scale. Payments for 1931 are estimated, while those for the preceding years are taken from the companies' annual reports. Disbursements are seen to have reached their peak in 1930, largely paid from the earnings of 1929, and to have fallen off sharply in the year just past to a point approximating the level maintained in 1927.

It is not so much the total of payments made during the entire year 1931, however, which is so significant, but the fact that the rate of payment dwindled steadily throughout the year. The rates started out rather bravely on a basis of 1930 earnings but, as business grew worse and worse, the rates diminished or disappeared altogether. The important dividend-paying railways which were not forced to take action to curtail payments to stockholders during the year might be told off on the fingers.

In spite of the fact, therefore, that the railways represented in this chart paid some 261 millions to their owners in 1931, their present basis of payment at the end of the year is on a far lower basis. With rates of payment presently in effect these railways will in 1932 pay only 157 millions to their owners; and yet it appears plainly evident that the rates now in effect may be revised downward still further before any more

Table I—Comparison of Dividends and Taxes, 1911 to 1930

Year Ended June 30	Dividends *	Proportion of Net Income Paid in Dividends	Taxes *
1911	$397,068,724	81	$98,626,848
1912	339,964,855	85	109,445,407
1913	322,300,406	66	118,386,859
1914	376,098,785	108	135,572,579
1915	259,809,520	82	133,276,330
1916	281,936,371	47	145,517,034
Year Ended December 31			
1916	306,176,937	47	157,113,372
1917	320,395,779	53	213,920,095
1918	275,336,547	71	223,175,379
1919	278,516,908	62.5	232,601,397
1920	271,731,669	63	272,061,453
1921	298,511,328	95	275,875,990
1922	271,573,751	73	301,034,923
1923	296,127,048	53	331,915,459
1924	320,429,767	57	340,336,686
1925	342,020,885	49	358,516,046
1926	399,243,963	49	388,922,856
1927	411,581,093	61	376,110,250
1928	430,677,138	55	389,432,415
1929	490,125,673	55	396,682,634
1930	497,024,912	95	348,553,953

* Not including switching and terminal companies.

liberal tendency will again manifest itself. Table I, showing the totals of taxes and dividends, speaks for itself.

Dividend Changes

Most of the changes in dividend rates of the year were either revisions downward or out-and-out omissions, although here and there an isolated instance of an unusual payment appears. No claim is made that the list is complete, but the record of the major changes is believed to be fairly comprehensive.

Among the most disconcerting events of the year has been the necessity for a suspension of dividends by companies which have had unbroken records for such payments over a long term. In this list appear prominently the New York Central, the Illinois Central and the Chicago & North Western. Scarcely more comforting was the reduction in dividend rates by many substantial companies to the lowest point in many years. Among the latter may be mentioned the Atlantic Coast Line, the Canadian Pacific, the Central of New Jersey (the last quarterly dividend on this stock was omitted entirely), the Delaware, Lackawanna & Western, the Great Northern, the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Northern Pacific, the Pennsylvania and the Southern Pacific.

Details of these changes follow:

Akron, Canton & Youngstown.—The directors in July omitted the usual quarterly dividend of $4.

Alabama Great Southern.—This company in November, while continuing its regular dividends, omittted to declare the usual extra 3 per cent on its preferred and common stock.

Atlanta & West Point.—The directors of this company in October reduced the annual dividend basis from 8 per cent to 4 per cent.

Atlantic Coast Line.—In 1930 this company paid $7 in regular dividends and $3 extra on its common stock. In 1931 the extra was omitted and the regular rate was, in November, reduced from an annual basis of $7 to one of $4.

Baltimore & Ohio.—Meeting in March, the directors of this company reduced the common dividend from 1¾ per cent to 1¼. Late in September they reduced it further to 1 per cent, and in December they omitted it altogether.

Boston & Maine.—In May the directors deferred action on the usual quarterly dividend of 1 per cent and, in August, definitely passed it. In December, while continuing the $1.75 quarterly dividend on the prior preference stock, they omitted dividends on all other classes of preferred.

Buffalo & Susquehanna.—The directors of this company, the stock of which is owned almost in its entirety by the Baltimore & Ohio, in December declared a dividend of $4 per share on the common stock, the first disbursement on this issue in six years.

Canadian Pacific.—The directors of this company in May reduced the quarterly dividend rate from 2½ per cent to 1¼.

Central of New Jersey.—The regular quarterly dividend of $2 was omitted in November, making the total disbursement for the year $6. In 1930 the stock paid a total of $4 in extra dividends as well as $8 regular.

Chicago & North Western.—This company, which paid $4 on its common in 1930, in 1931 paid one semi-annual dividend of $2 on this stock and then, in November, omitted both common and preferred dividends.

Chicago Great Western.—This company paid a quarterly dividend of $1 a share on its cumulative redeemable preferred stock, the first to be paid since 1919. Further payments of 50 cents were declared in April, June and October.

Chicago, Indianapolis & Louisville.—The directors of this company in June omitted semi-annual dividends of $3.50 on common and $2 on preferred.

Chicago, Rock Island & Pacific.—The directors of this company scaled down the quarterly dividend rate on common from $1.75 to $1.25 in the first quarter; thence to $1 in the second. In the third quarter it was passed entirely and in December action was likewise deferred on preferred dividends as well.

Cincinnati, New Orleans & Texas Pacific.—This company in 1931 declared its usual dividends of $8 per annum on common and $5 on preferred, and, in addition, paid an extra $3 on common. In 1930 it paid an extra of $50 on its common.

Colorado & Southern.—The directors in December omitted the customary annual dividend of $3 on its common stock.

Delaware, Lackawanna & Western.—The directors of this company in March and June declared quarterly dividends of $1. Prior thereto the rate was $1.50. In September the payment was reduced to 50 cents. In 1930 the annual rate was $6 with an extra of $1.

Erie.—The directors in June omitted the semi-annual dividend of $2 on this company's second preferred stock. In December the dividend on the first preferred was likewise omitted.

Great Northern.—The directors in December reduced the semi-annual dividend on preferred stock to $1 for the first half of the coming year. During the last half of 1931 the rate was $1.50. Prior thereto the stock had been on a $5 annual basis.

Gulf, Mobile & Northern.—Directors in February deferred action on the regular quarterly dividend due on the 6 per cent cumulative preferred stock.

Illinois Central.—In May the quarterly basis on common was reduced to an annual basis of $4 instead of $7 which had prevailed previously. In October the Dividend was omitted entirely.

Kansas City Southern.—In June the quarterly dividend on common was reduced to bring the annual rate down from $5 to $2 and in September it was omitted entirely.

Kansas, Oklahoma & Gulf.—The directors of this company in May reduced the payment on the 6 per cent non-cumulative series C preferred stock from an annual basis of 6 per cent to a basis of 3 per cent.

Lehigh Valley.—In 1930 the annual basis on common was 7 per cent. This was reduced to 5 per cent during the first half of 1931 and, for the latter half of the year, payments were omitted entirely.

Louisville & Nashville.—Early in the year the directors reduced the annual basis on the common stock from $7 to $5. In November they reduced it further to $4.

Maine Central.—The directors in September omitted the quarterly dividend on the common stock. In the preceding quarter the payment had been reduced to 75 cents from the customary $1.25.

Missouri-Kansas-Texas.—The directors of this company, who initiated an annual dividend rate of $4 on the common stock in 1930, omitted this dividend for the quarter ended March, 1931. In December they also omitted the $1.75 due quarterly on the preferred.

Missouri Pacific.—The directors of this company, meeting in December, failed to take action on the $1.25 quarterly dividend due on the preferred stock.

Mobile & Ohio.—This company, which in 1930 paid $7 in regular dividends and an extra of $5, in July omitted the regular semi-annual dividend of $3.50.

Nashville, Chattanooga & St. Louis.—In July the directors reduced the semi-annual dividend to $1.50 from the customary $2.50.

New York Central.—In 1930 the dividend rate was $8 per annum. In the first quarter of 1931, the basis was reduced to $6 and thereafter to $4. In December it was omitted entirely.

New York, Chicago & St. Louis.—In August the quarterly dividend of $1.50 on both common and preferred stock was omitted.

New York, New Haven & Hartford.—The directors in September reduced the annual rate on common from $6 to $4. In December they omitted it entirely.

Northern Pacific.—The directors of this company in September declared a quarterly dividend of 75 cents. Previously the rate was $1.25.

Pennsylvania.—The rate paid on the common stock of this company was 8 per cent for the first half of the year, 6 per cent for the third quarter and 4 per cent for the last quarter.

Pere Marquette.—The company omitted dividends on its common stock in May. Previously the annual rate had been 6 per cent regular and 2 per cent extra. No action was taken on preferred dividends at the September meeting of the directors.

Pittsburgh & West Virginia.—Dividends were deferred by the directors of this company in June. Prior thereto the stock had been on a $6 annual basis.

St. Louis-San Francisco.—This company, which maintained dividends at a quarterly rate of $2 on its common stock throughout the latter part of 1930, in 1931 made no disbursements at all.

Southern.—This company in 1931 disbursed common dividends at the rate of $6 per share—all but 35 cents of which, however, was declared in 1930. No further dividends on common have been declared and that on preferred was omitted in December.

Southern Pacific.—The dividend rate on common stock was reduced from 6 per cent per annum to 4 per cent at a meeting of directors in November.

Texas & Pacific.—The directors of this company, meeting in December, omitted declaration of the usual quarterly dividend of $1.25 on the common stock.

Virginian.—The annual basis on the common stock was reduced from 8 per cent to 6 per cent at a meeting of the directors in December.

Wheeling & Lake Erie.—This company this year paid a total of 14 per cent in dividends on its prior lien stock, as compared with 19¼ per cent in 1930.

Wabash.—In January, 1931, the directors deferred payment of dividends on both classes of preferred stock.

Security Issues

Railroad financing, except by short term loans arranged with bankers, was practically non-existent in the latter part of the year. Stock financing, also, was impracticable during the entire year by reason of the state of the market. The market for bonds, however, in the earlier part of the year, was relatively favorable and a number of carriers took advantage of this fact to secure funds for refinancing and for capital expendi-

Table IV—Receiverships Established in 1931

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
Ann Arbor	294	$10,670,000	$7,250,000
Apache	72	1,055,000	600,000
Chesterfield & Lancaster	37	186,000 (a)	500,000
Chicago, Attica & Southern	155	441,200	2,304,711 (b)
Colorado-Kansas	23	379,850	500,000
East & West Coast	48	624,333	250,000
Florida East Coast	865	57,000,000	37,500,000
Florida, Western & Northern	233	14,999,000	5,000
Fort Smith & Western	250	5,244,000	1,248,000 (c)
Georgia, Florida & Alabama	192	1,750,000	2,010,678 (d)
Maryland & Delaware Coast	39	189,000	.....
Murfreesboro - Nashville Southwestern	35	(no information obtainable)	
Pittsburgh & Susquehanna	18	300,000	300,000
Raleigh & Charleston	43	550,000	574,500
Rutland, Toluca & Northern	21	225,000	97,000
Savannah & Statesboro	33	185,000	200,000
Seaboard-All Florida	184	17,881,667	2,500
Ulster & Delaware	129	3,000,000	1,900,000
Wabash	2,524	124,108,388	138,120,699
Total nineteen companies	5,195	$238,788,438	$193,363,088

(a) See Note (a) in list "Railroads in the Hands of Receivers on December 31, 1931."
(b) Represented by 10,000 shares of no par value.
(c) Represented by 62,400 shares of no par value.
(d) Includes 10,000 shares of no par value.

Table V—Foreclosure Sales in 1931

Name of road	Mileage	Funded debt outstanding	Capital stock outstanding
* Chicago, Springfield & St. Louis	87	$500,000	$204,960
Kansas & Oklahoma	15	none	288,900
Two companies	102	$500,000	$493,860

* Property is still being operated by receiver.

Table II—Partial List of Securities Offered in 1930—Bonds

BONDS

Road	Maturity	Amount	Int. Rate	Sold to Banker Price	Sold to Banker % Cost	Offered to Public Price	Offered to Public Yield	Offered by
Boston & Maine, Series JJ	1961	$13,943,000	4¾	97	4.94	99¼	4.80	Lee Higginson & Co., Kidder Peabody & Co., Harris Forbes & Co., First National Old Colony.
Canadian National	1951	50,000,000	4½	....	...	98.25	4.60	Chase Harris Forbes Corp., Bancamerica Blair Corp., First National Old Colony Corp., and 33 other bankers.
Cinn. Union Terminal, Series B	2020	12,000,000	5	95	5.27	97.50	5⅛	J. P. Morgan & Co., First National Bank, Kuhn Loeb & Co., National City Co.
Louisville & Nashville	1941	10,000,000	5	95.75	5.56	98	5.25	J. P. Morgan & Company.
Missouri Pacific, Series I	1981	61,200,000	5	92.50	5.44	95	5.25	J. P. Morgan & Co., Kuhn Loeb & Co., and 7 other bankers.
New York Central, Series A	2013	75,000,000	4½	97.75	4.61	100	4.50	J. P. Morgan & Co., First National Bank, National City Co., Guaranty Co. of N. Y., Chase Securities Corp., Harris, Forbes & Co., Kidder Peabody & Co., Lee Higginson & Co.
New York Central (Big 4), Series E	1977	5,000,000	4½	98	4.6	100	4.50	J. P. Morgan & Co., and 3 other bankers.
New York Central (M. C.), Series C	1979	4,000,000	4½	100.50	4.475	102.5	4.35	J. P. Morgan & Co.
Pennsylvania, Series D	1981	50,000,000	4¼	94	4.56	96.50	4.42	Kuhn, Loeb & Co.
Pennsylvania (P. B. & W.), Series C	1977	11,301,000	4½	....	...	102	4.4	Kuhn, Loeb & Co.
Pennsylvania (P. O. & D.), Series A	1977	6,483,000	4½	98	4.6	100	4.5	Kuhn, Loeb & Co.
Pere Marquette, Series C	1980	8,000,000	4½	97.50	4.63	99.5	4.52	J. P. Morgan & Co., First National, Guaranty Co. of N. Y., National City Co., J. W. Seligman & Co., Chase Securities Corp.
Southern	1994	1,310,000	5	107	4.65	....	...	J. P. Morgan & Co.
Southern Pacific	1981	50,000,000	4½	94.25	4.80	96.75	4.67	Kuhn, Loeb & Co.
Toronto, Hamilton & Buffalo, Series A	1966	1,750,000	4½	....	...	99	4.55	Chase Securities Corp., Freeman & Co., A. E. Ames & Co.
Texas & Pacific, Series D	1980	13,000,000	5	96	5.226	98.50	5.05	J. P. Morgan & Co., Kuhn, Loeb & Co., Guaranty Co. of N. Y., First National Bank, Natl. City Co., Chase Securities Corp., Bankers Co. of New York.

Equipment Trust Certificates

Issue	Maturity	Amount	Int. Rate	Sold to Banker Price	Sold to Banker Cost %	Sold to Public Yield %	Offered by
New York Central, Series of 1930	1932-45	$7,020,000	4½	102.06	4.17	2½ to 4⅛	Chase Securities Corp., Freeman & Co., Harris Forbes & Co.
New York Central, Series of 1930	1932-45	3,094,000	4½	104.4121	3.78	2 to 3.95	Halsey Stuart & Co., Inc.
New York, New Haven & Hartford. Series of 1931	1932-46	2,595,000	4½	102.62	4.0965	2¾ to 4.15	Salomon Bros. & Hutzler, First National Bank.
Chicago, St. Paul, Minn. & Omaha, Series I, 1928	1932.46	240,000	4¾	92.5769	6	.....	Purchased by Chicago & North Western Ry.

Table III—Railway Securities Sold to Public in 1916 and 1920 to 1931

Year	Bonds	Notes	Stock	Total R.R. financing	Total all financing	Per cent R.R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.90
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.12
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.64
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.22
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.04
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.46
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.63
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.94
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.61
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
*1931	453,824,000	105,209,000	.....	559,033,000	2,662,982,040	21.0

* Eleven Months.

tures. Some of the larger public offerings are shown in Table II.

In Table III is given the total financing as shown by the Wall Street Journal under the various headings for the first eleven months of the year, as compared with twelve previous years. It will be noted that stock financing was, alone in this of all the periods shown, entirely non-existent. The total of all railway financing, however, while it was lower (for the eleven months) than that of any twelve-month period since 1926, nevertheless bulked larger in the proportion it bears to total financing of all enterprises than in any year since 1924.

Outstanding among the bond issues were those of the Pennsylvania and subsidiaries for upward of $67,000,000, the New York Central and subsidiaries for $89,000,000, and the Southern Pacific and the Canadian National for $50,000,000 each.

There was but little equipment trust business for the bankers. This was true in the first part of the year because there was little demand for money for this purpose. In the latter part of the year there was no reasonable market for the issues which were offered. One equipment trust issue during the year defaulted in a payment due on principal, the holders being offered securities of the company in exchange. This is one of only two or three such defaults in history, but it was sufficient to depress these issues to a point probably far below their merit.

Table VI—Railroad Mileage in the Hands of Receivers

(Figures to 1930, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1930. Figures for 1931 Compiled by *Railway Age)*

Year ended	Miles of road operated by receivers at close of year	Net change during the year in miles of road operated	Number of roads in charge of receivers at close of year
June 30, 1894	40,819	....	192
1895	37,856	—2,963	169
1896	30,476	—7,380	151
1897	18,862	—11,614	128.
1898	12,745	—6,117	94
1899	9,853	—2,892	71
1900	4,178	—5,675	52
1901	2,497	—1,681	45
1902	1,475	—1,022	27
1903	1,185	—290	27
1904	1,323	+138	28
1905	796	—527	26
1906	3,971	+3,175	34
1907	3,926	—45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,257	—5,273	39
1911	4,593	—664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,535	+7,130	94
Dec. 31, 1916	34,804	—2,550*	80
1917	17,376	—17,428	82
1918	19,208	+1,832	74
1919	16,590	—2,618	65
1920	16,290	—300	61
1921	13,512	—2,778	68
1922	15,259	+1,747	64
1923	12,623	—2,636	64
1924	8,105	—4,518	61
1925	18,687	+10,582	53
1926	17,632	—1,055	45
1927	16,752	—880	40
1928	5,256	—11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,796	+3,310	44

* Represents decrease for six months.

Railroads in Receivership

Nineteen railroads with $432,151,526 of securities outstanding were placed in receivership in 1931—the largest number of companies to have this misfortune in any year since 1917 when an equal number fell to the care of the courts. The securities affected, however, did not reach as high a total as they did in 1925 when the Milwaukee receivership was declared. The mileage—5,195—of roads placed in receivership in 1931 was the largest since 1925. The total mileage—12,796—in the hands of receivers at the end of the year was the largest since 1927.

Statistics of receiverships established, securities involved, foreclosure sales, etc., for the year, and for preceding years as far back as 1876 are given in the accompanying tables.

Of the roads which entered receivers' hands in 1931 the largest were the Wabash and the Florida East Coast. The Wabash's subsidiary, the Ann Arbor, followed it. Three other important receiverships, those of the Georgia, Florida & Alabama, the Florida, Western & Northern and the Seaboard-All Florida, were repercussions of the receivership of the parent company, the Seaboard Air Line, which was declared at the end of 1930. Other companies, operating over 100 miles of line, which came into the hands of the courts were the Chicago, Attica & Southern, the Fort Smith & Western and the Ulster & Delaware. The latter company is being acquired by the New York Central.

Table VII—Summary of Railroad Receiverships and Foreclosure Sales, 1876 to 1931

	Roads Placed in Receivership			Summary of Foreclosure Sales		
Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks
1876...	42	6,662	$467,000,000	30	3,840	$217,848,000
1877...	38	3,637	220,294,000	54	3,875	198,984,000
1878...	27	2,320	92,385,000	48	3,906	311,631,000
1879...	12	1,102	39,367,000	65	4,909	243,288,000
1880...	13	885	140,265,000	31	3,775	263,882,000
1881...	5	110	3,742,000	29	2,617	137,923,000
1882...	12	912	39,074,000	16	867	65,426,000
1883...	11	1,990	108,470,000	18	1,354	47,100,000
1884...	37	11,038	714,755,000	15	710	23,504,000
1885...	44	8,836	385,460,000	22	3,156	278,394,000
1886...	13	1,799	70,346,000	45	7,687	374,109,000
1887...	9	1,046	90,318,000	31	5,478	328,181,000
1888...	22	3,270	186,814,000	19	1,596	64,555,000
1889...	22	3,803	99,664,000	25	2,930	137,815,000
1890...	26	2,963	105,007,000	29	3,825	182,495,000
1891...	26	2,159	84,479,000	21	3,223	169,069,000
1892...	36	10,508	357,692,000	28	1,922	95,898,000
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000
1894...	38	7,025	395,791,000	42	5,643	318,999,000
1895...	31	4,089	369,075,000	52	12,831	761,791,000
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000
1897...	18	1,537	92,909,000	42	6,675	517,680,000
1898...	18	2,069	138,701,000	47	6,054	252,910,000
1899...	10	1,019	52,285,000	32	4,294	267,534,000
1900...	16	1,165	78,234,000	24	3,477	190,374,000
1901...	4	73	1,627,000	17	1,139	85,808,000
1902...	5	278	5,835,000	20	693	39,788,000
1903...	9	229	18,823,000	13	555	15,885,000
1904...	8	744	36,069,000	13	524	28,266,000
1905...	10	3,593	176,321,000	6	679	20,307,000
1906...	6	204	55,042,000	8	262	10,400,000
1907...	7	317	13,585,000	6	114	13,777,000
1908...	24	8,009	596,359,000	3	138	2,547,000
1909...	5	859	78,095,000	12	2,629	250,033,000
1910...	7	735	51,427,500	17	1,100	93,660,109
1911...	5	2,606	210,606,882	13	1,386	40,741,543
1912...	13	3,784	182,112,497	12	661	25,910,990
1913...	17	9,020	477,780,820	6	1,159	86,163,850
1914...	22	4,222	199,571,446	9	1,470	83,189,500
1915...	12	20,143	1,070,808,628	11	3,914	285,258,782
1916...	9	4,439	208,159,689	26	8,355	703,444,855
1917...	19	2,486	61,169,962	20	10,963	557,846,348
1918...	8	3,519	242,090,800	11	763	24,735,187
1919...	7	244	11,886,779	8	459	15,479,587
1920...	10	541	21,620,150	7	380	7,676,200
1921...	14	1,744	63,872,113	11	4,173	306,123,942
1922...	12	4,330	329,114,860	15	6,151	299,491,646
1923...	10	2,218	87,913,581	8	637	14,622,900
1924...	11	920	30,223,372	14	3,992	269,251,082
1925...	6	11,368	680,422,080	6	638	9,965,000
1926...	6	88	2,821,400	12	12,852	626,662,708
1927...	6	924	45,236,674	5	142	4,254,000
1928...	1	19	529,000	4	209	6,393,250
1929...	3	634	30,981,391	5	562	20,715,065
1930...	4	4,752	277,323,994	2	1,048	124,668,500
1931...	19	5,195	432,151,526	2	102	993,860

Table VIII—Railroads in the Hands of Receivers on December 31, 1931

Road	Mileage operated	Mileage owned	Date of receivership	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Alabama, Florida & Gulf	32	32	June 23, 1924	.....	.....	.....	Receivership terminated in March, 1929, but reorganization not yet effected.
Ann Arbor	294	294	Dec. 4, 1931	$10,670,000	$7,250,000	$18,340,800	
Apache Railway	72	72	Sept. 29, 1931	1,055,000	600,000	1,655,000	
California & Oregon Coast	15	15	Feb. 19, 1925	528,201	350,000	903,201	
Cape Girardeau Northern	13	104	Apr. 14, 1914	1,146,000	110,000	1,431,900	
Caro Northern	17	17	July 23, 1919	.....	.....	.....	
Chesterfield & Lancaster	37	35	Apr. 14, 1931	186,000 a	500,000	686,000	
Chicago, Attica & Southern	155	140	Aug. 5, 1931	441,200	2,304,711	2,745,911	10,000 shares of capital stock of no par value have been issued.
Colorado-Kansas	23	....	July 1, 1931	379,850	500,000	879,850	No official information available from receiver.
* East & West Coast	48	48	Feb. 2, 1931	624,333	250,000	874,333	
Florida East Coast	865	859	Sept. 1, 1931	57,000,000	37,500,000	99,580,000	
* Florida, Western & Northern	233	233	Feb. 2, 1931	14,999,000	5,000	15,004,000	
Fort Smith & Western	250	197	June 1, 1931	5,244,000	1,248,000	6,547,000	Capital stock represented by 62,400 of no par value.
Gainesville Midland	74	72	Feb. 15, 1921	949,285	550,000	1,499,285	See *Railway Age*, Jan. 5, 1929, p. 67.
Georgia & Florida	464	421	Oct. 19, 1929	7,446,000	13,382,441	21,928,441	Capital stock includes 100,000 shares common of no par value.
* Georgia, Florida & Alabama	192	192	Nov. 7, 1931	1,750,000	2,010,678	4,260,678	Capital stock includes 10,000 shares common of no par value.
Jacksonville & Havana	60 b	42	Feb. 1, 1930	300,000	160,810	460,810	
Maryland & Delaware Coast	39	39	July 28, 1931	189,000	.....	189,000	17,500 shares of capital stock of no par value have been authorized and issued.
Minneapolis & St. Louis	1,628	1,515	July 26, 1923	44,453,876	25,792,600	73,695,563	
Missouri & North Arkansas	365	335	May 5, 1927	3,500,000	3,000,000	7,155,000	
Murfreesboro-Nashville Southwestern	35	....	Mar. 23, 1931	.....	.....	.....	No official information obtainable.
Nevada Copper Belt	41	41	Apr. 2, 1925	622,000	.....	622,000	
North & South	41	41	Aug. 1, 1924	None	None	5,627,222	Court order judgments $4,911,771.
Ohio & Kentucky	40	39 c	Dec. 2, 1925	447,775	300,000	757,775	
Oklahoma Union	19	19	July 1, 1929	750,000	1,340,950	2,090,950	
Pittsburg, Shawmut & Northern	198	161	Aug. 1, 1905	14,655,600	15,000,000	31,377,950	
Pittsburgh & Susquehanna	18	18	Apr. 22, 1931	300,000	300,000	600,000	
Raleigh & Charleston	43	43	May 1, 1931	550,000	574,500	1,124,500	
Rio Grande Southern	174	174	Dec. 16, 1929	4,509,000	4,510,000	9,019,000	
Rutland, Toluca & Northern	21	21	Mar. 16, 1931	225,000	97,000	322,000	
Sandy River & Rangeley Lakes	97	97	July 8, 1923	837,000	340,000	1,177,000	
Savannah & Atlanta	145	142	Mar. 4, 1921	3,365,000	2,250,000	6,115,000	Reorganization ordered by court but not yet accomplished.
Savannah & Statesboro	33	33	May 1, 1931	185,000	200,000	385,000	
Seaboard Air Line	4,479	3,442	Dec. 23, 1930	140,914,612 d	85,110,662	253,329,274	
* Seaboard-All Florida	184	184	Feb. 2, 1931	17,881,667	2,500	17,884,167	
Tallulah Falls Railway	57	57	June 24, 1923	1,519,000	323,400	1,852,400	
Ulster & Delaware	129	129	Aug. 15, 1931	3,000,000	1,900,000	4,900,000	
Virginia Southern	9	9	May 3, 1926	75,000	25,000	100,000	
Wabash	2,524	2,041	Dec. 1, 1931	124,108,388	138,120,699	278,393,687	
Waco, Beaumont, Trinity & Sabine	115	115	Feb. 8, 1930	330,000	1,113,000	1,503,000	
Washington & Lincolnton	20	20	Oct. 21, 1930	100,000	140,868	240,868	
Wichita Northwestern	100	100	Nov. 10, 1922	381,750	1,690,000	2,119,750	
Winifrede	11	11	Mar. 15, 1927	None	150,000	150,000	
Wiscasset, Waterville & Farmington	44	44	Nov. 13, 1930	None	53,090	53,090	

* Leased to Seaboard Air Line.

(a) Exclusive of $67,000 principal amount of Second mortgage 6% Bonds matured January 15, 1918.

(b) This company has the right to operate over the line of the Chicago, Burlington & Quincy between Jacksonville and Waverly, a distance of 17.95 miles.

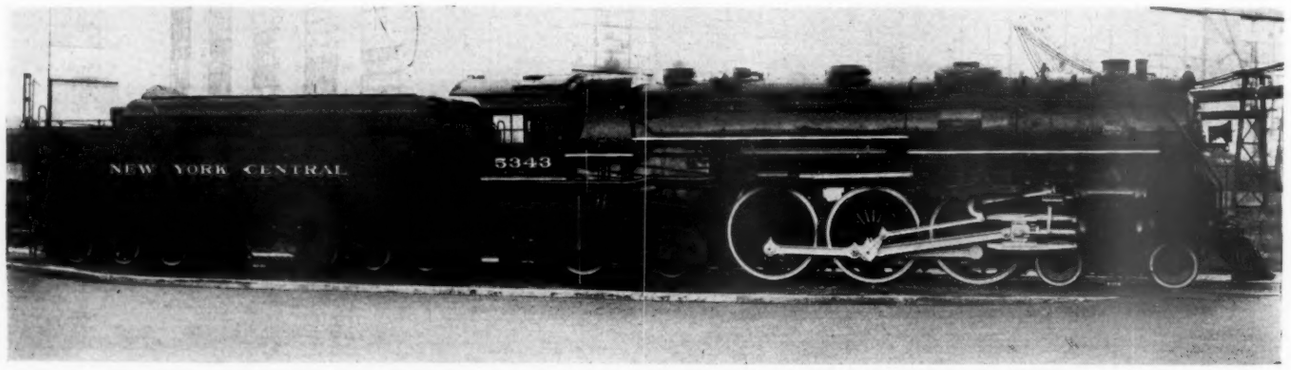
(c) Includes leased line also.

(d) Exclusive of pledged securities and exclusive of the following issues which became due on the dates indicated, no provision for the payment of such issues having been made up to the present time, viz:

Raleigh & Augusta Air Line First Mortgage Bonds Extended	Jan. 1, 1931	$1,000,000
Seaboard Air Line Railway Co. Three Year Secured Notes	Feb. 1, 1931	7,500,000
Seaboard & Roanoke First Mortgage Bonds Extended	July 1, 1931	2,500,000

The record for the year, while discouraging, is not as bad as it might have been nor, it is betraying no secret to say, as bad as it might be, provided relief from prevailing conditions is not soon forthcoming. The modest increase in freight rates to be lent to roads needing funds to meet fixed charges, the probability of a reduction in wages and the proposed Reconstruction Finance Corporation—all are projects which, if they materialize soon, will do much to prevent a bad record of receiverships in the coming year.

* * * *

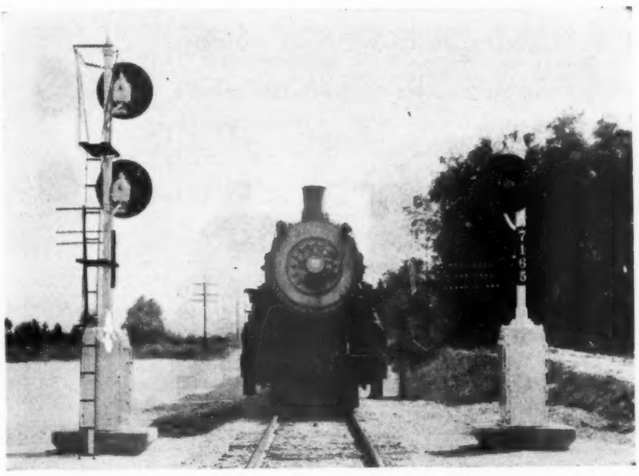


The Engine-Truck, Driving-Wheel and Tender-Truck Journals Have SKF Roller Bearings—No. 5344 Has Timken Bearings on Driving and Tender-Truck Journals—Built by American

Signaling Construction During 1931

Facilities completed total 60 per cent of those for previous year—Programs confined o installations effecting savings in operating expenses

By John H. Dunn
Signaling Editor, Railway Age



Above—Centralized Traffic Control on the D. & H. in New York

Left — Automatic Block Signaling on the A. C. L. in Florida

EXCEPT for a few large interlockings at passenger terminals, the construction of signaling facilities on the railroads of the United States and Canada during 1931 was confined largely to those projects which gave promise of tangible savings in operating expenses sufficient to show a worth-while return on the investment. It is remarkable, therefore, that the number of signaling units placed in service during the year totaled 60 per cent of that for 1930.

The construction of highway crossing signals continued on a large scale, the number of installations made in 1931 being 76 per cent of that for the previous year. New interlocking placed in service during 1931 included 98 per cent as many levers as in 1930. Remote and centralized control installations for the year just closed involved 77 per cent as many levers as for the previous year. Although the construction of these types of signaling continued on a scale comparing favorably with the programs of previous years, the installation of straight automatic signaling was considerably reduced, the mileage of road so equipped being only 37 per cent of that for the previous year while the number of signals installed was only 41 per cent of those installed in 1930.

During 1931 a total of 106 new interlockings were completed, as compared with the same number of plants for the previous year, but the average plant for 1931 was slightly smaller for they involved a total of 2,661 levers as compared with 2,707 in the plants placed in service during 1930. Automatic interlockings were installed at 62 crossings during the year just closed as compared with 79 in the previous year. Likewise, remote and centralized control facilities have continued to be popular, installations of this nature completed during 1931 involving a total of 651 levers as compared with 839 levers in 1930.

During 1931 the roads provided automatic protection at 1,136 highway grade crossings, using 2,368 signals and 34 gates, as compared with approximately 1,300 crossings using 2,984 signals and 46 gates during the previous year. The use of the new A.R.A. standard STOP signs in connection with many of these signals is the outstanding development in this field during 1931. Continued favor is being shown for spring switches, 122 such installations being made in 1931 as compared with 152 for 1930.

While it may be seen, therefore, that the installation of the classes of signaling just mentioned has continued in fairly large volume during the year just closed, straight automatic signaling was installed on only 1,385 miles of road in 1931, as compared with 3,683 miles in the previous year and an annual average for the last 10 years of 3,106 miles, the peak record being 5,127 miles in 1927. Car retarders were installed in three yards, requiring 41 retarders, during 1931, as compared with five yards using 98 retarders in 1930.

The field of railway signaling includes various equipment and different applications of similar devices. Therefore, as a measure of the total signaling construction, a table has been set up, allowing one unit of value for each automatic block signal, highway crossing signal, interlocking or remote control lever, power switch, car retarder, etc. Considered on this basis, the total volume of new construction in the signaling field for 1931 represents 10,788 units, as compared with 17,499 in 1930, 16,223 in 1929, and 12,301 in 1928.

No outstanding developments of new signaling systems were announced during 1931. However, decided progress has been made in the improvement of apparatus. The development of an electric locking device for spring switches, which has proved satisfactory in extensive tests during 1931, will provide increased safety for such switches and will, no doubt, result in numerous installations at points where the objection to reduced train speed has previously prevented their use. Furthermore, improvements have been made to speed up the operation of the coded system of control for centralized traffic control installations. As a part of a train-graph apparatus, one company has developed an OS recording device operating on the principle of an automatic typewriter.

Comparison of Annual Signaling Construction

Number of Units Completed Each Year	1928	1929	1930	1931
Automatic block signals	5,680	8,061	7,320	3,035
Highway crossing signals	2,271	2,505	2,984	2,368
Levers of interlocking	2,395	2,170	2,707	2,661
Levers of remote and centralized control	312	584	839	651
Power-operated switches in remote and centralized control	136	309	607	411
Signals controlled in remote and centralized control	600	1,150	1,517	879
Signals in automatic interlockings	160†	328	503	410
Spring switches	153	135	152	122
Levers added to rebuilt plants	455	403	619	114
Number of retarders	53	221	98	41
Power switches in retarder yards	86	357	153	96
Total	12,301	16,223	17,499	10,788

† Liberal estimate.

Automatic Block Signals Completed in 1931

Of the 1,385 miles of road equipped with automatic block signals during last year, 738 miles were single track, 597 miles were double track, and the remaining 51 miles were on lines of three or more tracks. The Atchison, Topeka & Santa Fe equipped 312 miles of single track with block signaling, the Union Pacific being second with 97 miles and the Missouri Pacific third with 71 miles. Of the 597 miles of double track equipped with signals in 1931, the Michigan Central equipped 133 miles, the Baltimore & Ohio 85 miles, and the Canadian Pacific 84 miles.

Of a total of 3,035 automatic block signals placed in service during 1931, 189 were semaphores and 2,846 light signals. Of the semaphores, 150 were installed on the Santa Fe, thus leaving only 39 for use on other

Table A—Automatic Block Signals Completed During 1931

Road	Location	Miles of Road	Number of Signals	Manufacturer
A. T. & S. F.	Chanute, Kan., to Independence	39.0s	46s 6c	Union
	Ochelata, Okla., to Tulsa	38.0s	52s	Union
	LaJunta, Colo., to Pueblo	62.9s	117c	Union
	Southland, Tex., to Justiceburg	31.7s	54c	Union
	Pyron, Tex., to Sweetwater	17.1s	30c	Union
	Rosenberg, Tex., to Bellville	40.4s	52s	Union
	Fullerton, Cal., to Fallbrook	59.2s	121c	Union
	Del Mar, Cal., to San Diego	23.3s	53c	Union
B. & O.	Rodemer, W. Va. to M. & K. Jct.	7.0t	24cp	Union
	M. & K. Jct., W. Va., to Blaser	4.8d	9cp	Union
	Blaser, W. Va., to Hardman	10.8t	38cp	Union
	Glenwood Jct., Pa., to Gilkeson	19.4d	29cp	Union
	Gilkeson, Pa., to Wheeling, W. Va.	42.8s	86cp	GRS
	N. Lima, Ohio, to Roachton	54.7s	91cp	Union
	Lima, Ohio, to N. Lima	2.5d	6cp	Union
	Maynard, Ohio, to Fairpoint	3.8s	14cp	GRS
Bd. of Trans., City of N. Y.	103 St. to Chambers St., New York	1.6d	222c	GRS
	Dover, N. H., to Rigby, Me.	18.5s	14c	Union
		30.5d†	46c	Union
B. & M.	Lowell, Mass., to No. Chelmsford	3.0d	3c	Union
	Lancaster, N. H.	0.5s	1c	Union
	No. Leominster, Mass., to Tyter	8.0d	8c	GRS
		2.5t	4c	GRS
		6.0d†	14c	GRS
		18.0d†	39c	GRS
		5.0t†	15c	GRS
B. & M. (Cont.)	Montague, Mass., to Soapstone	1.0s	1c	GRS
		3.5d	3c	GRS
		29.5d†	61c	GRS
C. N.	Montreal, Que., to Eastern Jct.	6.0d	23c	Union
	Matapedia, Que.	2.7s	4c	Union
	Regina, Sask.	4.0s	17c	GRS
G. T.	Royal Oak, Mich., to Pontiac	11.3d	13c	Union
C. P.	Vaudreuil, Que., to Mountain, Ont.	75.1d	88c	Union
	Mountain, Ont., to Bedell	8.0d	8c	GRS
	Cadorna, Que.	4.5s	24c	GRS
	Davenport, Ont.	0.9d	3c	Union
C. & O.	Fort Springs, W. Va., to Talcott	16.0d	24c	Union
	Macdougal, W. Va., to Sewell	10.0d	19c	Union
	Montgomery, W. Va. to Cabin Creek Jct.	9.0d	17c	Union
	Siloam, Ky., to Garrison	17.0d	28c	Union
C. M. St. P. & P.	Lawson Jct., Mo., to Moseby Jct.	12.6s	16c	Union
	Mosely Jct., Mo. to Birmingham	13.2d	20c	Union
C. R. I. & P.	Trenton, Mo., to Polo	28.5s 10.4d	89c	RRS
	Polo, Mo., to Lawson	11.2d	28c	RRS
	Lawson, Mo., to Moseby	12.0s	14c	RRS
	Miscellaneous	1.5s 1.0d	5c	RRS
C. S. S. & S. B.	Michigan City, Ind., to Michigan City	2.0s	2c	Union
D. & H.	Veeders, N. Y., to Schenectady	4.5s	5s	GRS
D. L. & W.	Jamesville, N. Y.	0.6s	1s	Union
	Syracuse, N. Y., to Industrial Springs	0.3s	2s	Union
	Oswego, N. Y., to Oswego Tunnel	1.3s	2s	Union
D. & R. G. W.	Pueblo, Colo., to Swallows	11.0d	12c	GRS
	Florence, Colo.	2.0d	2c	GRS
E. J. & E.	Chicago Heights, Ill.	....	1s	GRS
Erie	Griffith, Ind., to Hammond	8.0d	18c	Union
I. R. T.	212th St. to 241st	2.0d	24c	Union
	165th St. to Pelham Bay Park	4.1d	62c	Union
	138th St. to 157 St.	0.9d	6c	Union
L. & N.	Hagans Tunnel, Ky.	1.1s	2s	.....
	Glidden, Ky., to Popeville	1.6s	5s	.....
	Hagans, Va.	....	3s	.....
Me. C.	Royal Junction, Me.	....	5c	Union
	Hermon Pond, Me.	....	3c	Union
M. St. P. & S. Ste. M.	Superior, Wis., to Jct. 278	3.0s	4s 4c	GRS
M-K-T	Eureka, Tex., to Houston	7.0s	22c	Union
	Sealy, Tex.	2.0s	2c	Union
	Gainsville, Tex.	1.5s	2c	Union
M. P.	Council Grove, Kan., to Gypsum City	54.0s	87c	RRS
	Kirkwood, Mo., to Allenton	3.4s 14.7d	62c	GRS
I. G. N.	Palestine, Tex., to Elkhart	13.5s	18c	.....
N. C. & St. L.	Cedar St. to Shops Tower (Nashville, Tenn.)	2.0d	4s	Union
	Cherry St. to Oak St. (Nashville, Tenn.)	0.7d	4s	Union
N. Y. C.	St. Clair Place, N. Y., to Spuyten Duyvil	4.8d	14c	GRS
	Wende, N. Y., M. P. 422 to M. P. 4210	1.0f	2c	GRS
	Memphis, N. Y., M. P. 304.2 to 303.1	1.1f	2c	GRS
	E. of Oneida, N. Y., M. P. 263 to M. P. 265	2.0f	4c	GRS
	Mt. Vernon, N. Y., to Wh. Plains	11.0d	26c	GRS
	Mott Haven, N. Y., to Mt. St. Vincent	5.4f 1.8a	35c	GRS
	Tarrytown, N. Y., to Scarborough	4.4f	18c	GRS
	Buffalo, N. Y., M. P. 2.6 to M. P. 3.4	0.8d	1c	GRS
B. & A.	Brookline Jct., Mass., to Cottage Farm	1.6f	4c	GRS
C. C. C. & St.	Indianapolis, Ind., to Eastwood	1.0s 4.1d	3c	Union
M. C.	Niagara River, Ont., to St. Thomas	133.0d	179c	GRS
Rutland	Colchester, Vt., to So. Hero	3.3s	4c	GRS
	No. Hero, Vt., and Isle LaMotte	3.3s	4c	GRS
N. Y., N. H. & H.	New Haven, Conn., to Sound View	30.8d	50c	GRS
N. Y. R. T.	Montague tubes to Chambers St., New York	....	34c	GRS
	6th Ave. to 8th Ave., New York	....	5c	GRS
	Fulton St. to Stillwell Ave., New York	....	73c	GRS
	Broadway to Metropolitan Ave., New York	....	49c	GRS
	E. N. York to New Lots Rd., New York	....	16c	GRS
	Culver Line	....	4c	GRS
N. P.	Olympia, Wash.	0.8s	3c	GRS
N. W. P.	Almonte, Cal., to South Portal	1.6d	8c	Union
Penna.	New York, N. Y., to Kearny	4.7d	26p	Union
	New Brunswick, N. J., to Metuchen	6.8f	30p	Union
	Akron, Ohio, to Firestone	2.2d	5cp	H&B
	Clairton, Pa., to Coal Bluff	5.1d	1s 4p	Union
	Coleman, Pa., to Verona	3.4d	4p	Union
	W. Terre Haute, Ind., to Farrington, Ill.	5.3s	9p	Union
	Smithboro, Ill., to Marty	15.6s	21p	Union
	Jamaica, N. Y., to Hillside	1.4e	11p	Union
	Woodhaven Jct., N. Y., to Ozone Park	8.0d	9p	Union

Continued on Next Left Hand Page

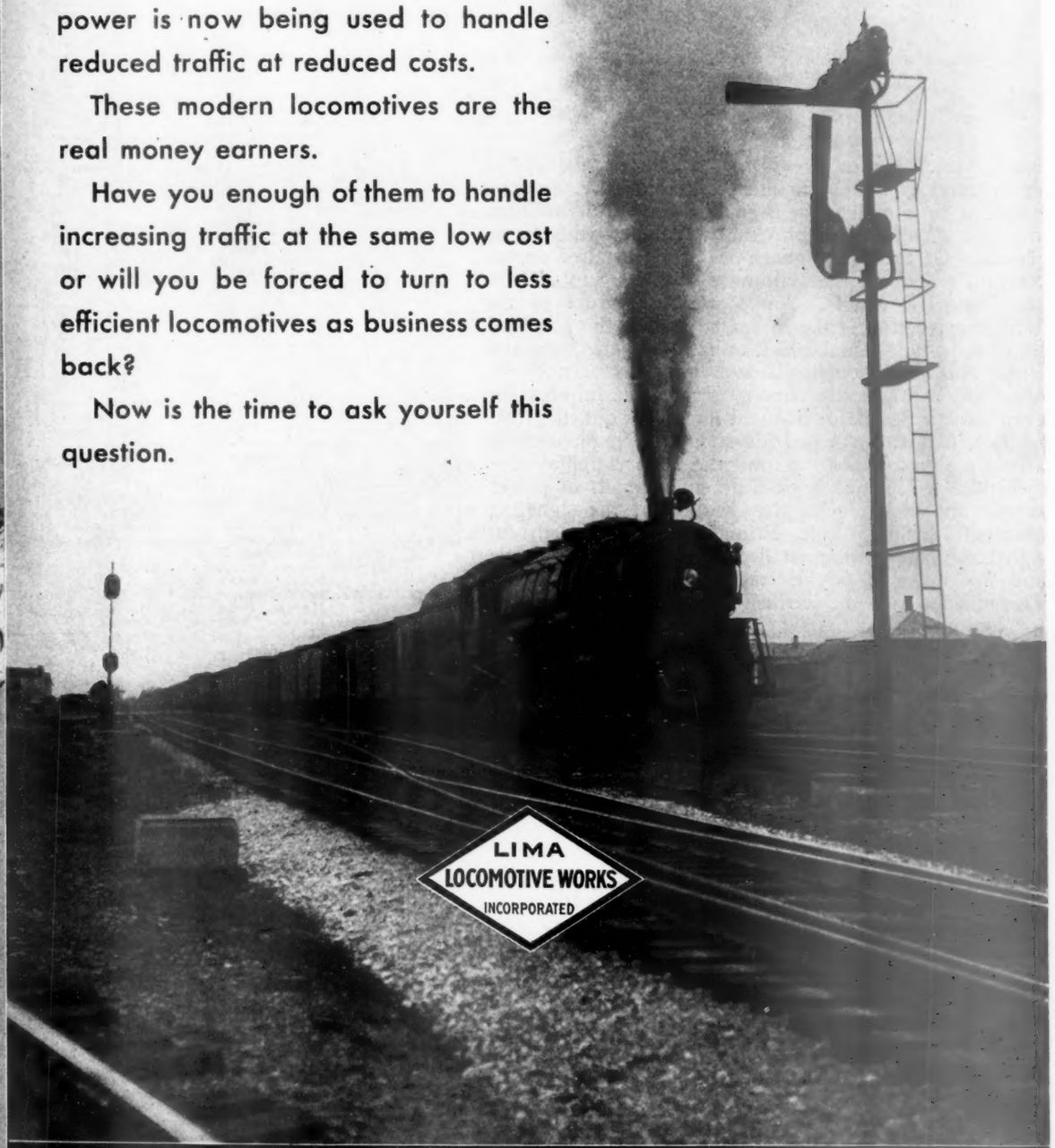
THESE Are The Money Makers

THE best of the railroads' motive power is now being used to handle reduced traffic at reduced costs.

These modern locomotives are the real money earners.

Have you enough of them to handle increasing traffic at the same low cost or will you be forced to turn to less efficient locomotives as business comes back?

Now is the time to ask yourself this question.



LIMA LOCOMOTIVE WORKS · Incorporated · LIMA, OHIO

Road	Location	Miles of Road	Number of Signals	Manufacturer
Penna. (Cont.)	Brooklyn, N. Y.	0.3d	2p	Union
P. & P. U.	Peoria, Ill., to Pekin	7.1d	42c	GRS
	East Peoria, Ill., to East Peoria	0.3s	3c	GRS
P. M.	Delray, Mich., to Detroit	4.2d	....	GRS
Reading	Glenside, Pa., to Hatboro	4.9s	16c	Union
		1.9d		
	Lansdale, Pa., to Doylestown	10.0s	21c	Union
	Yardley, Pa., to West Trenton, N. J.	2.2d	6c	Union
	Wayne Jct., Pa., to Fishers	0.6d	3c	Union
	M. P. 35, N. J., to M. P. 37	1.7d	2s	Union
			2c	
	Manville, N. J.	....	4c	Union
S. P.	Stockton, Cal.	0.9d	5c	Union
	Gilroy, Cal., to Sargent	5.5d	17c	Union
	Bakersfield, Cal.	0.3d	2c	Union
	Dayton Ave., Los Angeles, Cal.	0.5d	2c	Union
U. P.	Menoken, Kan., to Upland	70.0s	110c	Union
	Hastings, Neb., to Gibbon	27.0s	46c	Union
O. S. L.	Nampa, Ida.	....	3s	Union
L. A. & S. L.	Los Angeles, Cal.	0.7d	5c	Union
Wabash	Wellsville, Mo.	2.0s	2c	Union
	Milan, Mich., to Ann Arbor	13.0s	21c	Union
	Totals	737.5s	189s	
		596.7d	2,428c	
		25.3t	302cp	
		22.3f	116p	
		1.8a		
		1.4e		
		1,385.0	3,035	

In "Miles of Road" column: s = Single track, d = Double track. t = Three tracks. f = Four tracks. a = Six tracks. e = Eight tracks.
In "No of Signals" column: s = Semaphore. c = Color-light. p = Position-light. cp = Color-position-light.
† = Installed in connection with centralized control.

roads, which makes it evident that the installation of semaphores is limited in most cases to short sections required to complete the signaling on a full division, the rest of which was previously equipped with semaphores. Of the light signals, 381 were installed on the Santa Fe, 297 on the Baltimore & Ohio, and 209 on the Boston & Maine. An interesting feature of the 1931 construction is the increased use of the so-called searchlight-type signal which utilizes only one lamp and lens. A special double filament lamp has been developed which practically eliminates light-out failures for even though the major filament may burn out, the low-wattage filament will provide sufficient illumination to afford a signal indication until the lamp is replaced.

Tendencies in the use of different methods of power supply are shown by a classification of the signaling installed during 1931. Straight alternating-current signal equipment was installed on 16.9 miles of single and 44.4 miles of double track, including 165 signals. This mileage was on electrified lines or on lines equipped for continuous cab signaling. The a-c. floating system, using storage batteries charged by alternating current through rectifiers, was used on 459 miles of single and 552 miles of multiple track, including 1,736 signals. This a-c. floating system was also used for the line circuits and signal standby, with primary battery for track circuits on 202 miles of single and 37 miles of multiple-track lines, involving 495 signals. The a-c. primary system, using the a-c. supply for normal operation of the signals and primary battery for the line and track circuits was used on 23 miles of single and 14 miles of multiple-track lines, including 65 signals. Straight primary battery for signal operation, as well as for track circuits, was used on 50 miles of line requiring 67 signals. The remainder of the signaling installed during 1931 incorporated various combinations of the above mentioned systems of power supply.

The 1931 Interlocking Program

The interlockings constructed during 1931 included 106 new plants, of which 21 were mechanical, 52 electrical, 20 electro-pneumatic and 13 electro-mechanical, a total of 2,661 levers being involved. At 15 other plants which were rebuilt, a total of 114 new levers were added, making a total of 2,775 new levers of interlocking installed during 1931. In addition, many old plants were overhauled, replacing semaphores with color-light signals, installing electric locks, etc. The most extensive interlocking installation completed during 1931 was at the Toronto Terminal, including two plants of 169 working levers each and a third with 71 working levers. The Pennsylvania installed a plant at

Table B—Interlocking Plants Completed During 1931

Road	Location	Manufacturer	Working Levers: Mechanical	Electrical	Electro-Pneumatic	Elec.-Mech.: Mech.	Elec.
A. T. & S. F.	Argentine, Kan.*	GRS	..	3	..	..	..
	Augusta, Kan.	GRS	..	48	..	..	..
	Dumas Jct., Tex.	Union	..	7	..	..	..
	Newdale, Colo.	Union	..	2	..	..	..
	Gainesville, Tex.	GRS	..	21	..	..	..
	Alvin, Tex.	Union	..	2	..	..	..
	Los Angeles, Cal.*	GRS	..	35	..	..	..
A. C. L.	Sanford, Fla.	Union	..	..	4	..	..
B. & O.	Harpers Ferry, W. Va.	GRS	..	12	..	..	..
B. & M.	Johnsonville, N. Y.	Union	..	..	12	..	..
	East Northfield, Mass.	Union	..	..	10	..	..
	Boston, Mass.	Union	..	..	174	..	..
C. N.	Montreal, Que.	RRS	6	..	..	..	..
	Rockfield, Que.	RRS	..	..	..	1	1
C. P.	Peterboro, Ont.		15	..	..	..	..
	Vaudreuil, Que.	GRS	..	4†	..	..	..
	Cadorna, Que.	GRS	..	28†	..	..	..
C. R. R. of N. J.	Allentown, Pa.*	GRS	..	15	..	..	..
C. R. R. of Cuba	Central Fe, Cuba	GRS	8	..	..	..	..
	Central Adela, Cuba	GRS	4	..	..	..	..
C. & O.	Richmond, Va.	GRS	..	8	..	..	..
	East Alleghany, Va.	Union	..	9	..	..	..
	Kelleys Tunnel, Va.	Union	6	..	..	..	..
	Lakes Tunnel, Va.	Union	..	..	..	2	2
	Meadow Creek, W. Va.	Union	..	..	..	..	2
	Russell, Ky.	Union	..	..	..	..	1
C. & I. M.	Springfield, Ill.	Union	..	19	..	..	..
C. B. & Q.	Galesburg, Ill.	GRS	..	114	..	..	..
	Galesburg, Ill.	Union	..	..	37	..	..
C. G. W.	East Waterloo, Iowa	Union	..	4	..	..	..
	West Waterloo, Iowa	Union	..	7	..	..	..
C. R. I. & P.	Amarillo, Tex.	Union	..	6	..	..	..
	Howe, Okla.	Union	..	2	..	..	..
	Lock Springs, Mo.	RRS	..	5	..	..	..
	Polo, Mo.	Union	..	17	..	..	..
	Lawson, Mo.	Union	..	10	..	..	..
D. T. & I.	Leipsic, Ohio	Union	..	12	..	..	..
Erie	Lackawaxen, Pa.	Union	..	..	..	13	7
	Susquehanna, Pa.	Union	..	..	..	7	3
H. & M.	Hoboken, N. J.	GRS	..	44	..	..	..
I. C.	Chicago	GRS	..	68	..	..	..
	Belleville, Ill.	Union	12	..	..	..	..
I. U.	Indianapolis, Ind.	Union	..	..	106	..	..
K. & I. T.	Louisville, Ky.	GRS	..	11	..	7	10
L. & N.	Birmingham, Ala.	Union	..	60	..	..	..
	Cumberland River, Tenn.*	GRS	..	18	..	..	..
	North Hazard, Ky.*		..	5	..	..	..
Me. C.	Royal Junction, Me.*	Union	..	..	..	..	6
	Hermon Pond, Me.*	Union	..	1	..	..	..
	Portland, Me.	Union	..	..	..	..	1
M-K-T	Hillsboro, Tex.	Union	2	..	..	..	..
	Sealy, Tex.	Union	..	9	..	..	..
	Italy, Tex.	Union	2	..	..	..	..
M. P.	Kansas City, Mo.*		3	..	..	..	..
	Little Rock, Ark.*		2	..	..	..	..
	Rochelle, La.	RRS	2	..	..	..	..
	Georgetown, La.	RRS	2	..	..	..	..
	Selma, La.	RRS	2	..	..	..	..
	Tioga, La.	RRS	2	..	..	..	..
	Pineville Jct., La.	RRS	2	..	..	..	..
	Yates Center, Kan.	RRS	2	..	..	..	..
	Cairo, Ill.	GRS	2	..	..	..	..
	Conroe, Tex.	GRS	12	..	..	..	..
	Carrol St., St. Louis, Mo.	GRS	..	64	..	..	..
N. Y. C.	Sedgwick Ave., New York	GRS	..	25	..	..	..
	Black Rock, N. Y.	GRS	..	38	..	..	..
	Schenectady, N. Y.*	GRS	..	11	..	..	..
	St. Marys*		..	1	..	..	..
C. C. C. St. L.	Sandford, Ind.*		..	11	..	..	..
M. C.	Detroit, Mich.	GRS	..	2	..	..	..
P. & L. E.	Connellsville, Pa.	Union	..	5	..	..	..
N. Y. C. & St. L.	Painesville, Ohio	Union	..	..	..	18	3
	St. Marys, Ohio	GRS	..	2	..	..	..
	Portland, Ind.	Union	..	5	..	..	..
	Leipsic Jct., Ohio	Union	..	..	..	22	11
N. Y. B. T.	9th Ave., Subway, New York	Union	..	..	27	..	..
	8th Ave., Subway, New York	Union	..	..	30	..	..
	207th St. Yard, New York	Union	..	..	92	..	..
	207th St. Yard, New York	Union	..	..	46	..	..
	207th St. Yard, New York	Union	..	..	5	..	..
	168th St., New York	Union	..	..	19	..	..
	174th St., New York	Union	..	..	11	..	..
	81st St., Subway, New York	GRS	..	9	.	..	..
	81st St., Subway, New						

Road	Location	Manufacturer	Working Levers: Mechanical	Electrical	Electro-Pneumatic	Elec.-Mech.: Mech	Elec.
N.Y.B.T. (Cont.)	York	GRS	..	10	..	..	..
	59th St., Subway, New York	GRS	..	53	..	..	..
	42nd St., Subway, New York	GRS	..	24	..	..	..
	42nd St., Subway, New York	GRS	..	13	..	..	..
	30th St., Subway, New York	GRS	..	30	..	..	..
	Canal St., Subway, New York	GRS	..	20	..	..	..
	Hudson Term., New York	GRS	..	9	..	..	..
	Chambers G.	GRS	..	27	..	..	..
N. Y. R. T.	Broad St., New York	GRS	..	32	..	..	..
	Eighth Ave., New York	GRS	..	12	..	..	..
N. & W.	Portsmouth (Pass. Sta.), Ohio	Union	..	..	31	..	..
	Portsmouth (Gallia St.) Ohio	Union	..	..	25	..	..
	Bannon, Ohio	Union	..	..	34	..	..
P. E.	Oneonta Park, Cal.*	GRS	..	3	..	..	..
P. & B. R.	Sparrows Point, Md.	GRS	9	..	..	..	..
Penna.	Philadelphia ("Zoo"), Pa.	Union	..	..	143	..	..
	Philadelphia ("Broad"), Pa.	Union	..	..	96	..	..
	Dayton, Ohio	Union	..	..	..	6	..
	Urbana, Ohio	Union	..	..	..	4	4
	Jamaica, N. Y.	Union	..	..	70	..	..
	Woodhaven Junction, N. Y.	Union	..	..	16	..	..
	Brooklyn, N. Y.*	Union	..	..	1	..	..
P. M.	Leamington, Ont., Can.	GRS	..	1	..	..	..
	Pelton, Ont., Can.*		20	..	..	..	..
	Detroit, Mich.*	GRS	..	5	..	..	..
Reading	Philadelphia, Pa.	GRS	7	..	..	..	..
S. N.	Sacramento, Cal.*	Union	..	..	..	..	1
S. A. L.	Jacksonville, Fla.	Union	..	..	..	2	1
	Dover, S. C.	Union	4	..	..	..	..
S. P.	Newark, Cal.	GRS	..	21	..	..	..
	Los Angeles, Cal.	GRS	..	32	..	..	..
T. & N. O.	West Livingston, Tex.	Union	3	..	..	..	..
T. T.	John St., Toronto, Ont.	GRS	..	169	..	..	..
	Scott St., Toronto, Ont.	GRS	..	169	..	..	..
	Cherry St., Toronto, Ont.	GRS	..	71	..	..	..
U. P.	Sand Creek, Colo.	S. & F.	3	..	..	..	..
	Cheyenne, Wyo.	GRS	..	23	..	..	..
L. A. & S. L.	Hobart, Cal.*	GRS	..	4	..	..	..
Totals	New: Plants	106					
	New: Levers	2,661	137	1,407	989	82	46
	Rebuilt: Plants	14					
	Rebuilt: Levers	114	25	112	..	..	7

* = Rebuilt.
† = Centralized Control Type Machine.

Philadelphia involving 143 levers, while the Indianapolis Union completed a plant with 106 levers.

Especially at large terminal interlockings constructed during the past year, there is an increasing tendency to concentrate the control relays and other apparatus in the tower. This result is accomplished by using a-c. track circuits with rectifiers for the operation of d-c. relays. Likewise, some roads are using a-c. signal control circuits with d-c. relays at the signals, while others are using a-c. circuits to control the operation of light signals directly, with a transformer only at the individual signal unit.

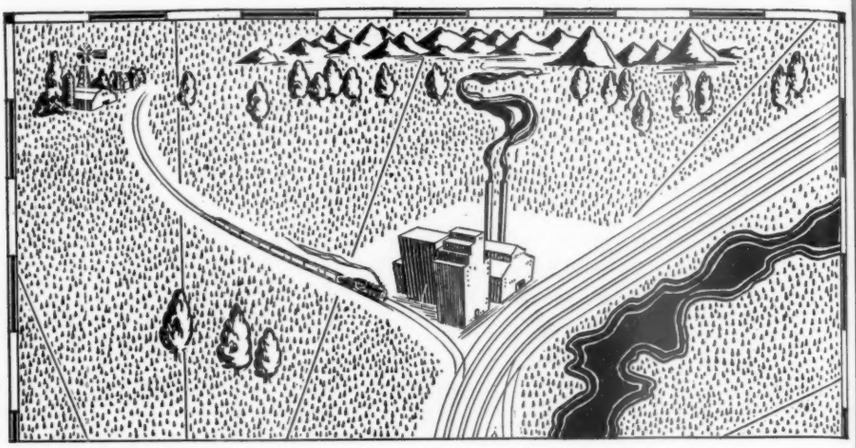
As a means of reducing operating expenses, many small manually-operated plants at railroad crossings, junctions and gauntlets are being replaced by automatic-

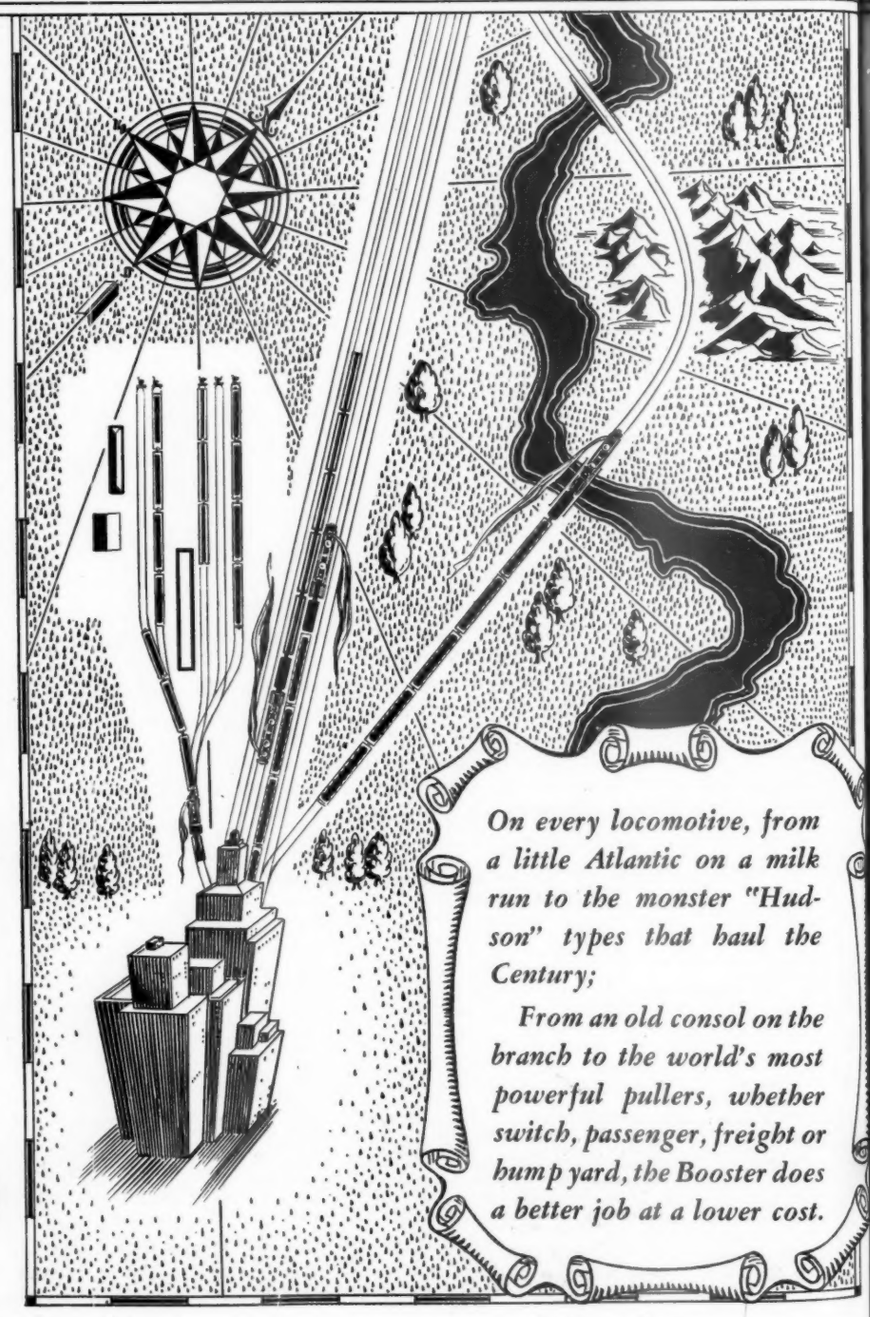
Continued on Second Following Left Hand Page

Table C—Remote and Centralized Control Installations Completed During 1931

Road	Location	Miles of Road	Manufacturer	Number of Levers: Desk Type	Centralized Type	Power Operated Switches	Number of Signals Controlled
A. T. & S. F.	Chillicothe, Ill.	3.0d	Union	18	..	12	12
	Strong City, Kan., to Neva	4.5d	Union	..	9	6	12
B. & O.	Gilkeson, Pa., to Wheeling, W. Va.	42.8s	GRS	..	44	23	67
	N. Lima, Ohio, to Roachton	54.7s	Union	..	60	33	63
	Maynard, Ohio, to Fairpoint	3.8s 1.6d	GRS	..	16	8	13
B. & M.	Dover, N. H., to Rigby, Me.	18.5s 30.5d	Union	..	51	35	34
	North Leominster, Mass., to Tyter	32.0d 7.5t	GRS	..	90	72	107
	Montague, Mass., to Soapstone	1.0s 36.0d	GRS	..	91	49	69
C. P.	Davenport, Ont.		Union	3	..	..	..
	Farnham, Que.		Union	1	..	..	..
C. & N. W.	Boone, Ia., to "BU"	1.8d	GRS	4	..	1	8
	Proviso, Ill.		GRS	2	..	1	4
C. B. & Q.	Galesburg, Ill., to Graham		Union	..	7	6	11
C. G. W.	Rice, Ill., to Winston	1.6s	Union	4	..	2	6
C. M. St. P. & P.	Belt Jct., Ind.	12.0s	Union	..	6	7	10
	Lawson, Mo., to Birmingham	13.5d	Union	..	7	5	12
C. R. I. & P.	Trenton, Mo., to Lock Springs	2.8s 10.4d	Union	3	8	4	19
	Polo, Mo., to Moseby	12.0s 11.2d	Union	2	10	6	17
C. St. P. M. & O.	Lakeland Jct., Minn.		GRS	3	..	..	..
C. S. S. & S. B.	Michigan City, Ind., to Davis	5.0s	Union	1	..	..	6
Erie	Tusten, Pa., to Lackawaxen	2.0d	Union	..	..	4	9
G. N.	Kootenai Falls, Mont.		GRS	..	..	1	3
L. V.	Hazleton Jct., Pa.		GRS	..	4	3	7
	Potter, N. J.		GRS	..	4	2	6
L. & N.	Atkinson, Ky.		Union	2	..	1	4
	Amqui, Tenn.		GRS	..	2	1	4
	Strawberry, Ky.		GRS	..	1	..	5
M. St. P. & S. Ste. M.	Superior, Wis., to Jct. 278	3.0s	GRS	1	..	1	..
M. P.	Kirkwood, Mo., to Allenton	3.4s 14.7d	GRS	..	11	7	40
	Miscellaneous Locations			..	..	7	..
	Bay City, Tex.		GRS	2	..	..	4
N. Y. C. B. & A.	Brookline Jct., Mass.		GRS	..	9	2	12
	West Pittsfield, Mass.		GRS	..	5	2	7
C. C. C. & St. L.	Morgan, Ohio, to DeGraff	4.1d	Union	..	10	8	20
	Terre Haute, Ind.	1.0d	Union	..	9	5	14
	Winchester, Ind.	1.0d		2	..	2	8
	Ansonia, Ohio	1.0d		2	..	3	8
M. C.	Albion, Mich.			..	..	2	8
N. Y. C. & St. L.	Farmdale, Ill.		Union	2	..	1	5
N. Y. N. H. & H.	Guilford, Conn., to East River	2.1d	Union	..	7	4	7
	Westbrook, Conn., to Saybrook	3.9d	Union	..	2	2	6
Penna.	South Fork, Pa., to Summerhill	2.0f 2.0d 1.0s	Union	7	..	3	9
	Trafford, Pa., to Pitcairn	1.1d	Union	6	..	5	8
	Johnstown, Pa., to Sang Hollow	3.0t	Union	4	..	3	5
	Gallitzin, Pa., to Bennington	1.1f	Union	8	..	6	9
	Tiffin, Ohio, to Coleman	1.0s	Union	2	..	1	4
	New Castle, Ind., to Foley	2.2s	Union	3	..	1	3
	Urbana, Ohio, to Urbana	1.1d	Union	4	..	3	6
P. M.	Sunnyside, Mich.			4	..	3	11
	Port Huron, Mich.			3	..	2	2
Reading	Ewing, N. J.	1.7d	Union	..	5	4	8
	Manville, N. J.		Union	2	..	2	4
S. A. L.	Hamlet, N. C.	1.0s	Union	4	..	1	6
S. P.	Martinez, Cal.		Union	..	3	1	5
T. & N. O.	West Junction, Tex.		Union	2	..	1	8
	San Antonio, Tex.		GRS	2	..	1	8
T. & P.	Nussbaumer, Tex., to Dallas	9.9d	GRS	..	5	6	35
Wabash	State Line, Ind., to Lafayette	37.0s	Union	..	28	13	42
	Delphi, Ind.		Union	..	2	1	3
	Clymers, Ind.		Union	..	2	1	3
W. P.	Keddie, Cal.	2.1s	Union	..	8	2	13
	Totals	205.2s 197.2d 10.5t 3.1f					
		416.0		104	547	411	879

s = Single track. d = Double track. t = Three track. f = Four track.



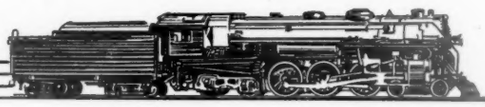


On every locomotive, from a little Atlantic on a milk run to the monster "Hudson" types that haul the Century;

From an old consol on the branch to the world's most powerful pullers, whether switch, passenger, freight or hump yard, the Booster does a better job at a lower cost.

Four-Wheel Trailer Booster

THE LOCOMOTIVE BOOSTER IS UNIVERSAL



All Over The Country In Every Kind Of Service Boosters Are Speeding Operation and Reducing Costs

WHEREVER there is an important passenger train, The Booster is needed for an easy start and a better "on time" record.

Wherever there is a freight train, The Booster is needed to start and accelerate to road speed; to pull out of sidings or to lift over a grade, to reduce overtime.

Wherever there is a switch engine with exceptionally heavy duties, The Locomotive Booster is needed to get the drag moving, or help over the hump.

Intensive power production calls for the incorporation of The Locomotive Booster in the design of every locomotive—large and small. In no other way can you get the greatest work out of every pound of metal.

Unless a locomotive has a Booster, it must be built heavier in order to get the required tractive power to start the load it can haul at speed.

Once underway, such a locomotive carries excess weight. It is not loaded to capacity. It has a pair of drivers which could be dispensed with, as far as hauling ability is concerned.

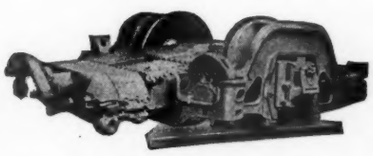
Contrast this with a Booster-equipped engine loaded according to capacity at speed. The Booster is cut in only when needed. It uses idle weight and spare steam for starting, accelerating and to maintain speed on grades.

Greater tonnage is hauled, resulting in lower operating costs.

FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK CHICAGO MONTREAL

Four-Wheel Tender Booster



Two-Wheel Trailer Booster

Six-Wheel Tender Booster

ally-controlled signals, commonly termed automatic interlockings. These plants can be operated at such low cost as to warrant installation at layouts not formerly interlocked, thus eliminating many train stops. For example, the Union Pacific installed seven such plants on one division of the St. J. & G. I. during 1931. A total of 62 such plants, involving 410 signals and 6 smashboards were placed in service during 1931.

Especially during 1931, centralized traffic control continued to take an increasingly important part in the field of signaling. Outstanding installations of centralized control on single track were completed during 1931 on the Baltimore & Ohio between Toledo, Ohio, and Lima, and between Pittsburgh, Pa., and Wheeling, W. Va. The application of centralized traffic control for the direction of trains in either direction on one or more tracks of a multiple track system has likewise proved very effective, installations of this nature being completed during 1931 on the Santa Fe between Holliday, Kan., and Olathe, and on the Peoria & Pekin Union between Peoria, Ill., and Pekin. Numerous other remote and centralized traffic control installations were completed in 1931, a total of over 416 miles of line being so equipped. These projects included 411 power-operated switches and 879 controlled signals, 547 levers of the centralized type and 104 of the desk type being used.

The simplified control machines developed for centralized control have been adapted for use at regular interlockings, the locking being accompanied by relays and interlocking circuits rather than by mechanical locking. A large plant of this type was installed during the past year at Quebec, Que., on the Canadian Pacific, and others of similar construction are under way at the union passenger station in Toledo and at the new station of the Toronto, Hamilton & Buffalo at Hamilton, Ont.

As a means of preventing train stops at certain switches where trailing movements predominate, the railroads continued to install spring switches, a total of 122 such layouts being placed in service during the last year, including 47 on the Santa Fe and 25 on the C. & O.

Table D—Automatic Interlockers Completed During 1931

Road	Location	Manufacturer	No. of Signals	No. of Smash-boards
Alton	Sudduth Jct., Ill.	GRS	8	..
A. T. & S. F.	Sparks, Okla.	Union	4	..
	Iola, Kan.	Union	7	..
	Etter, Tex.	Union	8	..
	Plainview, Tex.	Union	8	..
	Lubbock, Tex.	Union	7	..
A. C. L.	Mattox, Fla.	Union	8	..
B. & O.	Washington, Ind.	.....	4	..
C. N.	Wakaw, Sask.	.....	10	..
	Ridge, Sask.	.....	8	..
C. P.	Rosetown, Sask.	Union	10	..
	Rosetown, Sask.	Union	6	..
C. & N. W.	Rhinelander, Wis.	.....	5	..
	Lake Preston, S. D.	.....	4	..
C. B. & Q.	Virden, Ill.	.....	10	..
	Pacific Jct., Ia.	.....	1	..
	Council Bluffs, Ia.	.....	6	..
	Ravenna, Neb.	.....	2	..
C. G. W.	Rochester, Minn.	Union	4	4
C. R. I. & P.	Ramona, Kan.	Union	4	..
	Phillips, Tex.	Union	8	..
	Hutchinson, Kan.	GRS	2	..
	Whitewater, Kan.	RRS	4	..
	Stratford, Tex.	RRS	8	..
	Howe, Okla.	Union	6	..
	Oklahoma City, Okla.	RRS	3	..
	Waterloo, Iowa	Union	7	..
	Lock Springs, Mo.	RRS	12	..
C. St. P. M & O.	Lakeland Jct., Minn.	GRS	10	2
D. & R. G. W.	Lakota, Utah	GRS	8	..
	El Moro, Colo.	GRS	9	..
E. J. & E.	Wayne, Ill.	GRS	1	..
Ft. W. & D. C.	Acme, Tex.	.....	8	..
G. N.	Hanover, Br. 53, Mont.	GRS	8	..
	Colebrook, Br. 70, B. C.	GRS	4	..
	Stronghold, Cal.	GRS	8	..
I. C.	Sand Ridge, Ill.	.....	7	..
	Independence, Ia.	.....	8	..
K. C. S.	Asbury, Mo.	GRS	7	..
L. V.	Perth Amboy, N. J.	.....	4	..
M. P.	Hope, Kan.	.....	4	..
	DeQuincy, La.	GRS	6	..
	Palestine, Tex.	GRS	7	..
N. Y. C.	Arlington, Ohio	GRS	6	..
P. & E.	Mackinaw, Ill.	.....	6	..
N. Y. C. & St. L.	Peru, Ind.	.....	4	..
P. E.	Bell, Cal.	Union	10	..
Penna.	Downing, Ill.	Union	6	..
P. M.	McGregor, Ont.	.....	6	..
St. L.-S. F.	Truman, Ark.	Union	5	..
St. L. S-W.	Swestern, Tex.	.....	8	..
S. A. L.	Chester, S. C.	Union	10	..
	Oleander, Fla.	Union	8	..
	Crawford, Fla.	Union	8	..
S. P.				
T. & N. O.	Tatsie, Tex.	Union	9	..
	Orange, Tex.	Union	8	..
T. & P.	Hodge, Tex.	GRS	8	..
U. P.				
L. A. & S. L.	Ontario, Cal.	Union	5	..
	Ontario, Cal.	Union	1	..
	South Gate, Cal.	Union	8	..
St. J. & G. I.	Edgar, Neb.	Union	11	..
	Endicott, Neb.	Union	10	..
	Totals—62 plants...		410	6

Highway Crossing Protection

Regardless of other curtailments during 1931, the railroads continued active programs of highway crossing protection, a total of 1,136 crossings being protected with 2,368 signals and 34 gates. Of these signals, 405 were wig-wag and 1,746 flashing-light signals, while 97 were of the rotating Stop sign type with flashing lights.

Table E—Highway Grade Crossing Protection Installed in 1931

Name of Road	Number of Crossings Protected	Number of Wig-wag Signals	Number of Flashing-light Signals	Number of Rotating Stop Sign Signals with Flashing Lights	Number of Traffic Type Stop and Go Signals	Number of Remotely-Controlled Gates
Alton	6	...	12	...	...	...
A. T. & S. F.	78	69	2*	...	...	...
	...	20†	...	...	...	...
A. C. L.	3	...	...	...	2	3‡
B. & O.	80	...	186	...	...	...
B. & L. E.	2	...	4	...	...	...
	4	...	8*	...	...	...
B. & M.	10	...	20	...	...	...
	1	...	...	...	1	...
B. R. & P.	1	...	2	...	...	4
	2	...	4*	...	...	...
	8	...	16	...	...	...
C. N.	20	22	2	...	...	4
	7	...	14*	...	...	...
C. P.	10	13	...	...	...	...
C. of Ga.	3	...	4	...	...	...
C. R.R. of N. J.	3	...	6	...	...	...
C. V.	2	...	4	...	...	...
C. & O.	25	...	93	...	...	...
C. & E. I.	11	...	22	...	...	...
C. & I. M.	2	...	2	...	...	...
C. & N. W.	18	42	...	...	...	...
	6	...	11	...	...	...
	1	...	...	2	...	...
C. & W. I.	3	...	4	...	2	4
C. B. & Q.	15	2	28	...	...	...
C. G. W.	16	...	30	...	...	1
C. M. St. P. & P.	2	1	2	...	...	...
	28	...	...	55	...	...
C. R. I. & P.	17	1	34	2	...	...
	3	6*	...	...	...	...
C. St. P. M. & O.	4	3	...	2	...	...
C. S. S. & S. B.	4	...	2	...	1	1
	...	...	9*	...	...	...
C. & S.	1	...	2	...	...	...
D. & H.	3	...	6	...	...	...
D. L. & W.	19	...	56	...	...	...
D. & R. G. W.	7	...	12	...	...	...
D. T. & I.	9	...	7	...	...	...
E. J. & E.	2	...	4†	...	...	...
	1	...	2	...	...	...
	1	...	4*	...	...	...
Erie	59	1	87*	...	16s	...
			61			
G. N.	3	...	...	6	...	...
I. C.	22	...	73	...	...	4
I. T.	2	...	4	...	...	...
K. C. S.	1	...	2	...	...	...
K. & I. T.	6	...	10	...	...	4
L. & H. R.	1	...	2	...	...	...
L. & N. E.	4	...	8	...	...	...
L. V.	7	...	14	...	...	...
L. & N.	24	...	53	...	...	4
Me. C.	10	...	10	...	...	...
M. & St. L.	4	1	2*	...	...	...
	...	...	1	...	...	...
M. St. P. & St. Ste. M.	14	6	10	12	...	...
D. S. S. & A.	6	...	2	10	...	...
M. K. T.	4	...	8*	...	...	...
M. P.	15	...	38*	...	...	...
	9	...	18	...	...	...

Continued on Next Left Hand Page

THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

Ready For Another Year of Service

FACING 1932 the American Arch Company is ready for another year of service to American railroads.

Ready to supply the finest Arch Brick from the following sources picked because of their exceptional clay deposits and advantageous locations:

HARBISON-WALKER REFRACTORIES CO.
Pennsylvania
Ohio
Kentucky
Alabama
Missouri

NORTH AMERICAN REFRACTORIES CO.
Pennsylvania
Kentucky

IRONTON FIRE BRICK CO.
Ohio

DENVER SEWER PIPE & CLAY CO.
Colorado

ATHENS BRICK & TILE CO.
Texas

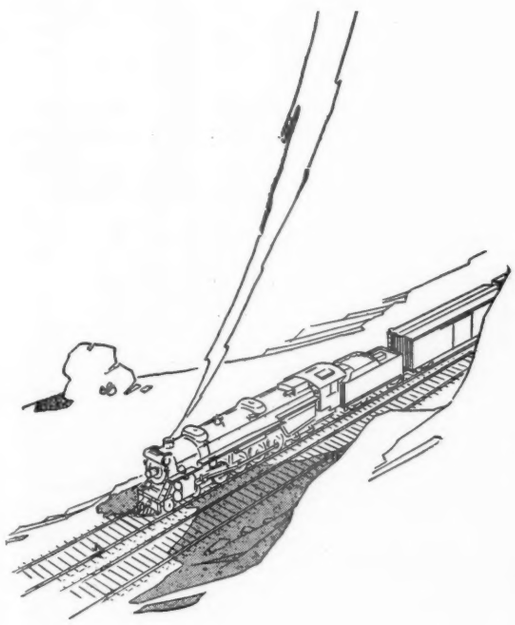
MOULDING-BROWNELL CORP.
Ohio

GLADDING-McBEAN & CO.
California
Washington

DIAMOND FIRE BRICK CO.
Colorado

DOMINION FIRE BRICK & CLAY PRODUCTS LTD.
Saskatchewan, Canada

CANADA FIRE BRICK CO. LTD.
Ontario, Canada
Quebec, Canada



Also ready to continue its designing and servicing of locomotive arches and to supply every element that enters into a satisfactory arch brick supply.

AMERICAN ARCH CO.

Incorporated

LOCOMOTIVE COMBUSTION SPECIALISTS

NEW YORK CHICAGO

Name of Road	Number of Crossings Protected	Number of Wig-wag Signals	Number of Flashing-light Signals	Number of Rotating Stop Sign Signals with Flashing Lights	Number of Traffic Type Stop and Go Signals	Number of Remotely-Controlled Gates
I. G. N.	4	3	8*	...	...	...
G. C. L.	2	...	4	...	...	...
N. C. & St. L.	8	...	16*	...	...	...
N. Y. C.	25	...	33	...	...	...
			20			
B. & A.	3	...	...	...	13	...
M. C.	27	54	...	...	...	...
	20	...	52	...	...	...
	1	...	2*	...	...	...
C.C.C. & St.L.	20	...	45	...	...	...
P. & E.	6	...	13	...	...	...
Rut.	6	...	12	...	...	...
P. & L. E.	1	...	2	...	...	...
I. H. B.	2	...	3	...	...	...
N. Y. C. & St.L.	6	...	12*	...	4	...
	33	...	62	...	...	...
N. Y. N. H. &H.	11	...	26	...	...	...
	....	...	9†	...	...	...
N. Y. O. & W.	4	...	12	...	...	...
N. & W.	23	45†	...	...	3	...
N. P.	1	...	...	2	...	...
	10	...	20	...	...	...
P. E.	16	20	...	...	...	...
Penna.	49	...	115	...	...	...
	19	...	42*	...	...	...
P. & P. U.	1	...	2	...	...	...
P. M.	17	...	29	...	4	...
		...	4†	...	...	...
Reading	18	...	37	...	...	...
R. F. & P.	1	...	2†	...	...	...
St. L.-S. F.	3	...	6*	...	...	...
	3	...	3	...	...	...
	2	2	...	...	...	...
S. A. L.	24	...	50	...	...	...
S. P.	58	45	8	6	56	2
T. & N. O.	8	...	...	...	18	...
	3	3	...	...	...	...
	2	...	...	...	...	6
	1	...	2	...	...	...
T. & P.	7	...	5	...	...	...
		...	2*	...	...	...
U. P.	8	10	6	...	...	...
O. S. L.	10	20	...	...	...	...
L. A. & S. L.	8	13	...	...	...	...
S. J. & G. I.	3	2	4	...	...	...
Vir.	2	4	...	...	...	...
Wab.	8	...	16*	...	...	...
A. A.	2	...	4*	...	...	...
W. M.	17	...	32	...	...	...
		...	2†	...	...	...
W. P.	3	3	...	...	...	...
W. & L. E.	1	...	2*	...	...	...
Totals		340	1,434			
		65†	291*			
			21†			
	1,136	405	1,746	97	120	37

* = New A. R. A. automatically controlled illuminated STOP sign used in conjunction with regular wig-wag or flashing-light signal.
† = New A. R. A. button-type reflector sign reading "Stop on Red Signal" used in conjunction with regular wig-wag or flashing-light signal.
‡ = Semaphore type crossing signal.
s = Stop sign or signal only.

About 120 stop-and-go signs or simple Stop signs were installed and 15 crossings were protected by gates.

The most important development in crossing protection during 1931 was the adoption by several roads of the new American Railway Association standard stop signs. The automatically controlled STOP sign was installed in connection with 291 flashing-light signals while the button reflector-type signs reading "Stop on Red Signal" were applied to 65 wig-wags and 21 signals. To stimulate their use, the A.R.A. committee on Highway Crossing Protection has prepared a bulletin including the detail specifications for these stop signs, which is now ready for distribution.

Train Control Activities Limited

The construction of automatic train control during 1931 was limited. The Michigan Central installed intermittent train stop on 133 miles of double-track main line between St. Thomas, Ont., and the Niagara River, and the Reading provided cab signaling, involving whistle and acknowledgment but without the brake-applying apparatus, on 13 miles of electrified territory between Jenkintown, Pa., and Lansdale, about 70 multiple-unit cars being equipped. On the other hand, the Great Northern made a formal plea to the Interstate Commerce Commission for permission to remove the train control system on 229 miles of main line between New Rockford, N. D., and Williston.

On February 6 the commission granted a petition of the Pennsylvania, following a hearing on December 16, 1930, to operate in interdivisional runs over territory in part equipped with train control or train stop devices, locomotives equipped with the continuous system of four-indication cab signals without the brake-applying apparatus. The Pennsylvania has about 800 locomotives equipped with cab signals only, which are generally operated over the voluntary installations of cab signaling, although in emergency they are operated also over territory involved in the I. C. C. orders.

Table F—Car Retarder Installations Completed During 1931

Road	Location	No. of Classification Tracks	No. of Towers	No. of Retarders	Rail Ft. Retarders	No. of Power Switches	No. of Switch Signals	Manufacturer
C. B. & Q.	Galesburg, Ill.	49	3	20	1,540	52	52	Union
N. Y. C. O. C. L.	Stanley, Ohio	42	3	20	1,540	43	43	GRS
Waukegan Gen. Co.	Waukegan, Ill.	2	1	1	77	1	..	Union
Totals		93	7	41	3,157	96	95	

The Interstate Commerce Commission has advised all the carriers, except one, noted in the different orders, that their installations, as now arranged, substantially meet the requirements, although in 10 instances there are points in question to be settled, such as desired changes in maintenance practices, lack of protection at crossings with other carriers, etc. The Bureau of Safety is making periodical inspections of conditions of maintenance and operation of automatic train control on the various roads. Each carrier involved has had one inspection, and the second tour of inspections is well along. The method of conducting tests and maintenance at various terminals, with particular reference to the making of departure tests, which have been criticized by the commission in several instances, and the details of reporting, investigating and tabulating irregularities in operation, are given particular attention in these inspections.

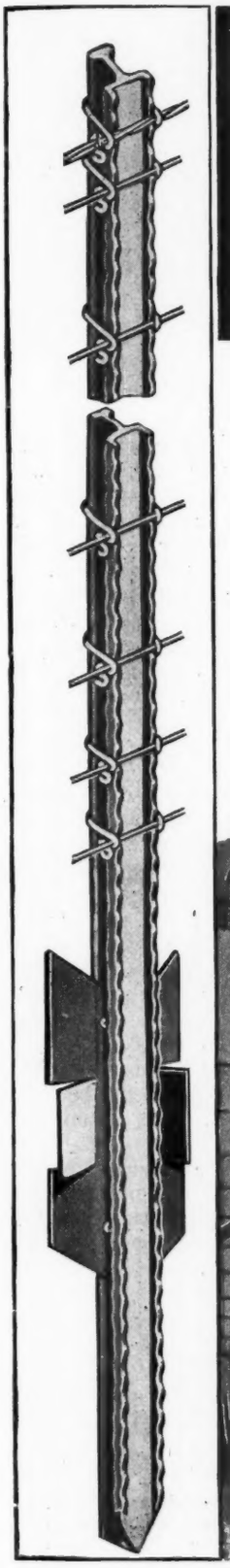
The Bureau of Safety, I. C. C., and Committee on Automatic Train Control, A. R. A., have jointly made studies of testing methods and facilities in connection with certain types of train control equipment, and have conducted investigations of a number of false proceed operations.

Table G—Spring Switches Installed During 1931

Road	Number	Road	Number
A. T. & S. F.	47	D. L. & W.	1
A. C. L.	3	D. & R. G.	5
B. & O.	3	E. J. & E.	1
B. & M.	1	I. C.	1
C. of G.	1	L. & N.	1
C. & O.	25	M. P.	6
C. & E. I.	1	N. Y. C. & St. L.	1
C. & N. W.	6	N. & W.	3
C. B. & Q.	2	P. & P. U.	1
C. M. St. P. & P.	2	S. P. (T. & N. O.)	5
C. R. I. & P.	6	Total	122

Based on the investigations of certain accidents during the early part of 1931, a warning was issued to the effect that proper rules were not in effect on all roads with respect to the use of the forestalling feature. In brief, it is considered essential by the commission that an engineman must have taken action to reduce speed at a distant signal before operating the forestalling device.

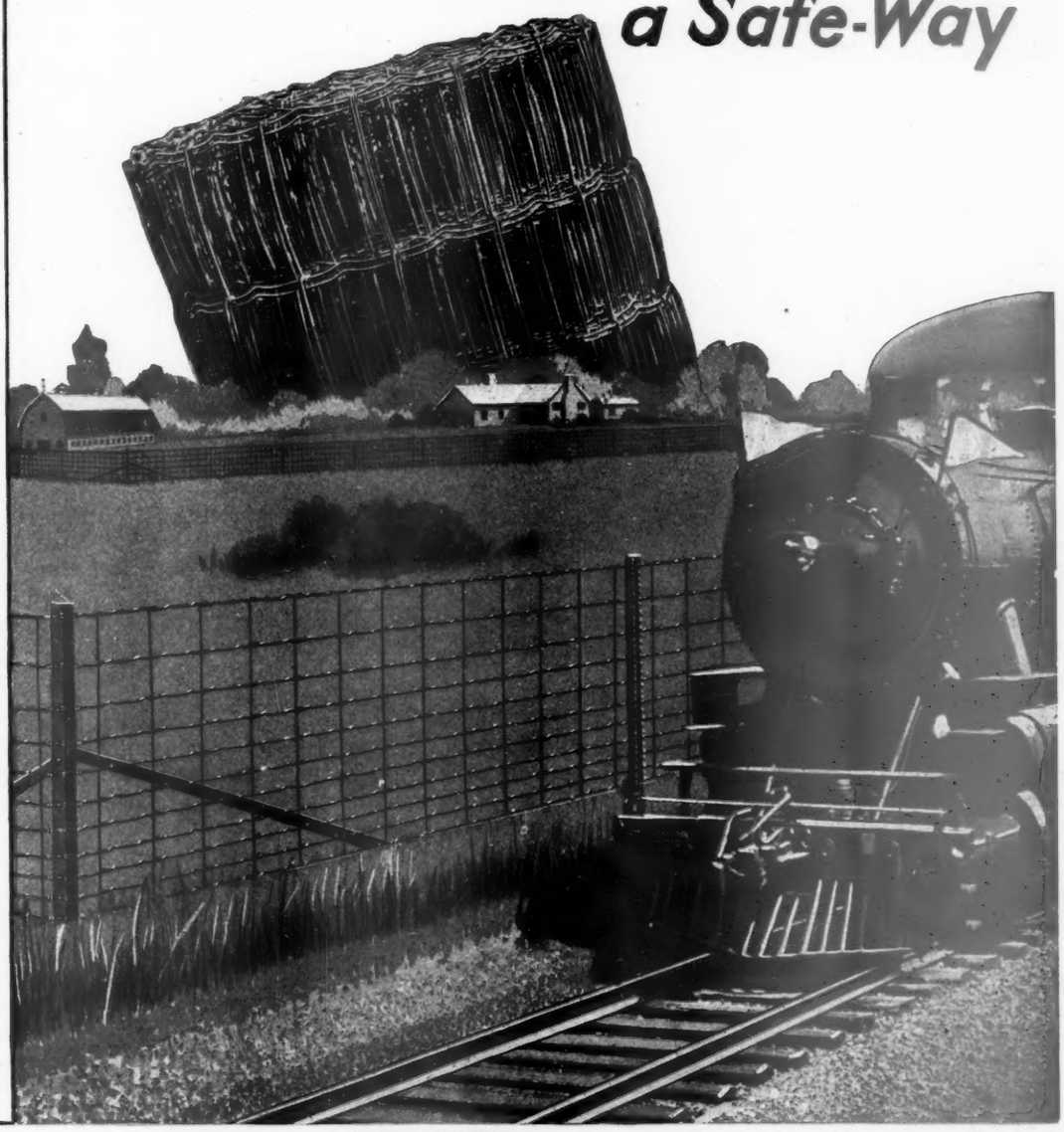
Statistical Section Continued on Next Left Hand Page



AMERICAN Fence and BANNER STEEL POSTS

IT is cheaper to put up a good fence than to pay stock claims. Likewise it is economy to buy adequate protection—proved protection—such as that offered by American Railroad Fence and Banner Steel Line Posts—the post of railroad rail construction. These products including National Expanding Anchor End and Corner Posts meet every specification recommended by the American Railway Engineering Association.

Make Your Right-of-Way - - a Safe-Way



1831 MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING 1932

AMERICAN STEEL & WIRE COMPANY

208 South LaSalle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors. Columbia Steel Company, Russ Building, San Francisco — *Export Distributors:* United States Steel Products Company, New York

Wider Use of Trucks Dominant in Motor Transport

Store-door service offered by many roads—Railways stabilize motor coach operations without extending them greatly

By John C. Emery
Motor Transport Editor, Railway Age

PHYSICAL co-ordination of railway and highway facilities, designed to improve and to make more economical the service rendered, was substantially advanced during 1931. Particularly was this true in the case of freight transportation, which had been accorded less attention than passenger transportation in previous years. The quickening of freight service by co-ordination of train and truck was the outstanding development in the motor transport field last year. Motor coach operation by the railways was a less pressing subject, unquestionably for the reason that co-ordination of passenger train and motor coach service by the railways had already been advanced much farther than had the co-ordination of rail and truck service.

The provision of store-door pick-up and delivery service for freight became the rule rather than the exception in the greater part of the western territory during 1931. The greatest increases in the use of trucks by railways, therefore, were to be found on the western roads. Whereas a few of these railways had previously made more or less extensive experiments with pick-up and delivery service, last year virtually all railways west of the Mississippi river adopted this plan of meeting truck competition over part, if not all, of their territories. There was likewise some further replacement of train service with over-the-road truck service, but not to the extent involved in the adoption of terminal pick-up and delivery service.

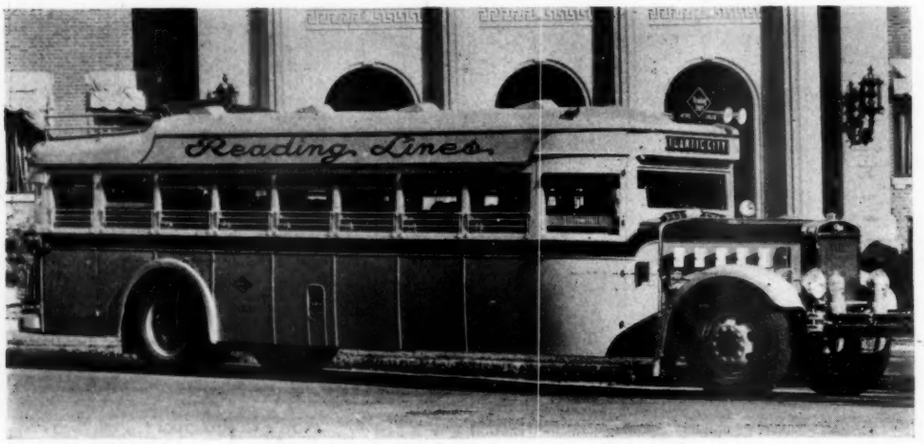
Operations More Stable

The general tendency in motor coach operation was to place on a more stable basis the operations already in effect, rather than to extend them greatly. The peak in motor coach operation in general, so far as services independent of the railways are concerned, was passed two years ago. At least a temporary peak in railway motor coach operation has also been reached, although there are indications that there will be additional operation of motor coaches to supplement or replace train service when the present business crisis has passed. A few railway motor coach lines were discontinued during 1931, due to nearly complete drying up of traffic, but in general services were maintained and the efforts of the officers in charge were concentrated upon the problem of improving the service rendered while effecting economies wherever possible.

Railway Motor Transport's Growth

Railway motor coach operation, which had its inception only seven years ago, has had a remarkable growth. In 1925 only 10 railways were making any use of motor coaches, and the small scale of their operations was indicated by the fact that they had in service only 300 motor coaches. By the end of 1930 the number of railways operating motor coaches had increased to 81, while the number of motor coaches they were operating, either directly, through subsidiary companies, or through companies in which they held a substantial stock interest, had attained a total of 4,000. In 1931 there was virtually no change in the number of railways operating passenger highway equipment, but the number of motor coaches operated, it is estimated, reached a total of 5,000.

Motor trucks, tractors and trailers were used in freight service by approximately 85 railroads during 1931, and the number of pieces of equipment employed is estimated at 10,000. This represents an increase of 25 in the number of railways using highway freight equip-



One of Many Motor Coaches Used by Railways to Supplement Their Passenger Train Service

Continued on Next Left Hand Page

CARNEGIE MEANS SPEED WITH SAFETY

WHEELS are the focal point of safe transportation. Efficient signal systems, necessary as they are, cannot offset inadequate materials in rolling stock. Upon wheels must rest a major share of responsibility.

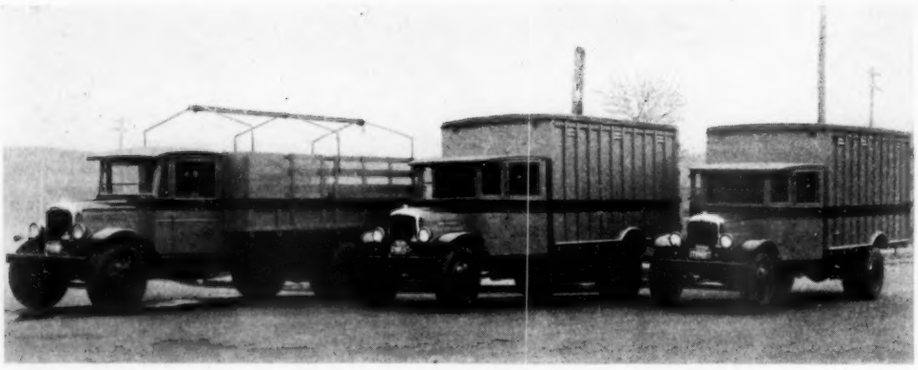
Carnegie Wrought Steel Wheels have earned an enviable reputation for the efficient manner in which they have shouldered this responsibility for many important railroad systems. To serve even more efficiently, Carnegie Rim-Toughened Wrought Steel Wheels are now available for all classes of service. The process of heat treatment to which these wheels are subjected insures additional service and additional safety out of all proportion to the small increase in cost.

Carnegie Rim-Toughened Wrought Steel Wheels have the stamina to endure the stress and strain of modern high-speed transportation. Carnegie equipped means speed with safety.. means service with economy. Carnegie engineers are at your service at all times.

CARNEGIE
WROUGHT STEEL WHEELS

146

CARNEGIE STEEL COMPANY · PITTSBURGH · PA. Subsidiary of UNITED STATES STEEL CORPORATION



Railroad-Owned Trucks, Like These of the Cotton Belt, Speed Merchandise Deliveries

ment, as compared to 1930, and an increase of nearly 50 per cent in the number of trucks, tractors and trailers in service. The rapidity of the expansion of railway motor truck services is indicated by the fact that as recently as 1925 only 15 railways were using motor trucks, tractors and trailers in connection with their freight service, and the number of such vehicles operated was only 900.

Truck Competition Sharper

While independent motor coach operation has tended to decrease during the last two years, independent motor truck operation competitive with the railways showed a marked increase during 1931. This competitive condition was largely the cause of the more extensive use of trucks by the railways in 1931. It has been pointed out that motor trucks are no longer a factor merely in the transportation of l.c.l. freight; they are steadily encroaching further upon the railways' carload business. Due in large measure to current business conditions, as well as to modern methods of merchandising, commodities which formerly moved principally in carloads are now being forwarded in l.c.l. lots, and this has been an important source of traffic to independent truck lines, whose rates in general are as low as the railway carload rates, if not, indeed, considerably lower.

Better Service the Answer

The railways which have made the most determined fight to retain or recover traffic for which the highway carriers are competing have done so through improved service, including store-door pick-up and delivery, through reduced rates, or through a combination of these measures. The plan originated by the Pacific Electric—that of establishing a subsidiary company which acts as an express company, carrying freight from the door of the shipper to the door of the consignee under its own bills of lading, contracting with the parent railway company for the movement of freight between stations, and with trucking companies for the pick-up and delivery service in terminals—was adopted by several more of the western roads during 1931. This plan has the advantage of being sufficiently flexible to enable both competitive rates and service to be met, where this is necessary. Other roads have tariffs in effect which provide for pick-up and delivery service with or without charge, and they are endeavoring to meet their motor truck competition by offering as good or better service than their competitors, with less regard to the level of competitive rates.

Outstanding Developments in 1931

Among the outstanding new developments in truck operation during 1931 was the establishment by the Boston & Maine, the New Haven and the Pennsylvania of truck service co-ordinated with unusually fast merchandise train service, which effects overnight delivery of freight between widely-separated points in New England, and between New England and New Jersey, Pennsylvania and Maryland points; the action of all the southwestern lines in providing free pick-up and delivery service on l.c.l. traffic moving within a radius of 300 miles; the provision of store-door service for a small extra charge by railways operating west and northwest out of Chicago; and the adoption of the Pacific Electric "express company" plan by several railways in the western states.

Outstanding events in the field of railway motor coach operation were the organization of the Pennsylvania-Greyhound lines, which provides motor coach service throughout Pennsylvania territory; the extension of the Reading Transportation Company motor coach lines over almost the entire Reading railway system; the completion of the St. Louis Southwestern plan to replace local passenger service with motor coach service wherever possible; and the expansion of the operations of the Interstate Transit Lines, subsidiary of the Chicago & North Western and the Union Pacific, particularly in North Western territory.

The Regulatory Situation

With respect to regulation of commercial motor vehicles, there were a number of changes in the rules governing the operations of intrastate carriers. Popular sentiment against the overcrowding of the highways by large, heavy commercial vehicles was reflected in the enactment by a number of state legislatures of laws rigidly restricting the dimensions of the vehicles operated. In some states also, notably Texas, steps were taken to bring into line the rates and service of so-called contract truck operators. Interstate highway operations continued without regulation, owing to the failure of Congress to pass appropriate legislation. It is expected that efforts will be made at the current session of Congress to put through a bill providing for the regulation of both motor coach and motor truck interstate operations.

Orders for Highway Vehicles

Railways, together with their subsidiaries and affiliated motor transport companies, ordered a total of 269 motor coaches, 841 motor trucks, 53 tractors, 62 trailers, and eight passenger automobiles during 1931 according to replies received by *Railway Age* in response to questionnaires seeking such data. Comparable 1930 figures are: Motor coaches, 541; motor trucks, 1,696; tractors, 15; trailers, 21; passenger automobiles, 51. As has been the case in previous years

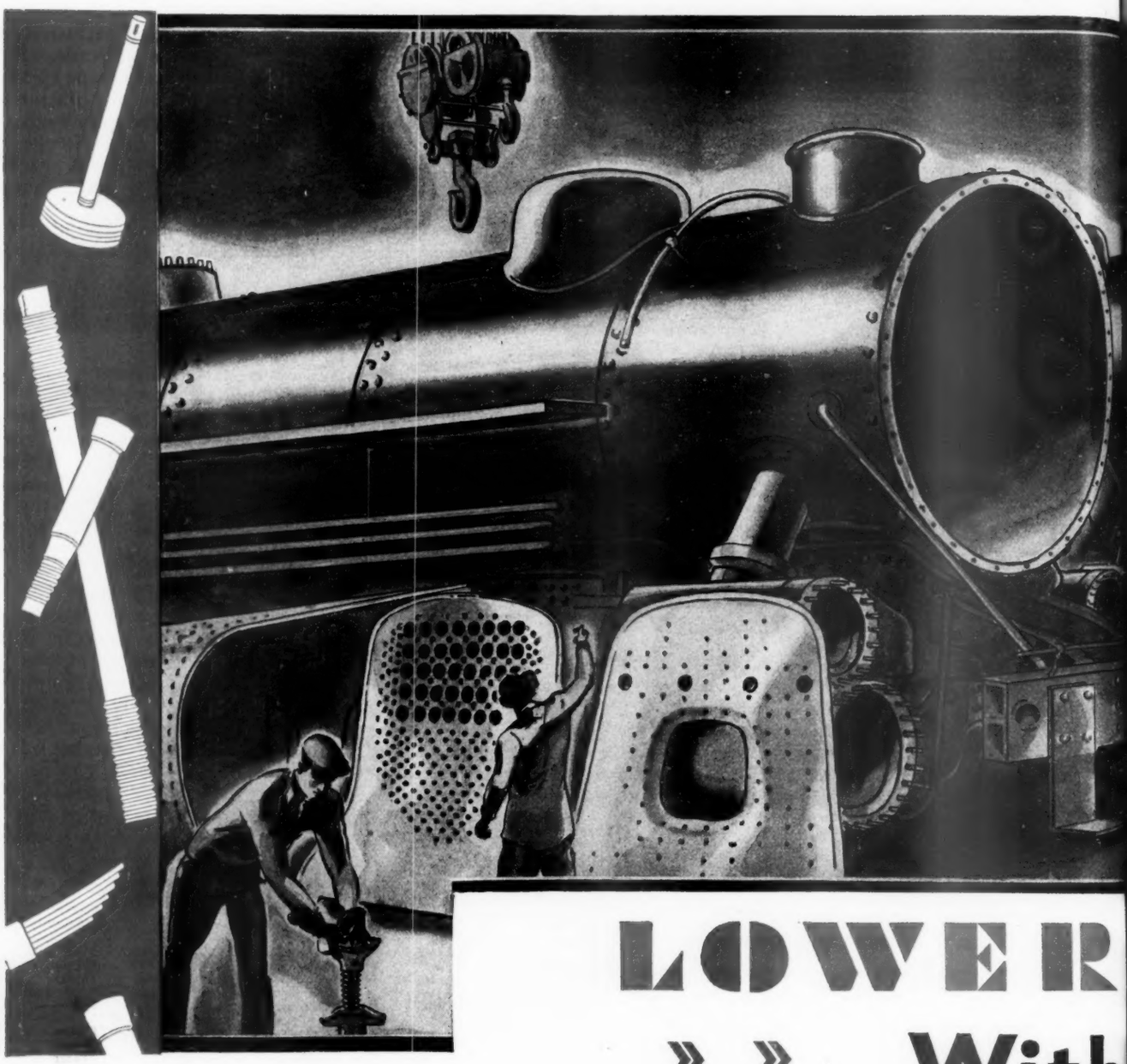
so also in 1931 was the Railway Express Agency the largest purchaser. During the past year it ordered 783 motor trucks, 11 tractors and one trailer or a total of 795 highway vehicles. In 1930 the Express Agency ordered 1,597 trucks, nine tractors and three trailers or a total of 1,609 highway vehicles.

Statistics of these motor vehicles ordered by railroads and their affiliates are somewhat fragmentary, as was pointed out in similar discussions of prior years. Vehicles ordered by contractors engaged exclusively in railway work are not reported by the railroads. Furthermore, many sales to the railroads are made by local dealers and are therefore not known to manufacturers, who in addition to the railways receive questionnaires designed to collect the accompanying data. Replies to these questionnaires sent to manufacturers are checked with the railway replies in order that the most accurate totals obtainable may be derived.

Orders for Highway Vehicles

Railroad	No.	Type of Vehicle	Model designation	Seating capacity or truck capacity in tons	Purchased by railroad or subsidiary	Where to be used	Manufacturer
Baltimore & Ohio	6	M. Coach	Parlor	16-20	Subsidiary	Rev.	General Motors
Boston & Maine	6	M. Coach	Parlor	29	Subsidiary	Rev.	Yellow
	4	Truck	Model AA	1½ ton	Railroad	Co. Business	Ford
	2	Tractor	Model 20	.....	Railroad	Co. Business	McC.-Deering
Central of Georgia	2	M. Coach	City	23	Subsidiary	Rev.	White
	2	M. Coach	Pass. & Frt.	9 Pass.—2 ton	Subsidiary	Rev.	Int. Harvester
Central of New Jersey	2	M. Coach	Parlor	40	Subsidiary	Rev.	Mack
Chesapeake & Ohio	1	Truck	Model AA	1½ ton	Railroad	Co. Business	Ford
	1	Truck	.....	.....	Railroad	Co. Business	Chevrolet
Chicago, Burlington & Quincy	1	M. Coach	V-225	16	Subsidiary	Rev.	General Motors
Chicago, Indianapolis & Louisville	1	Truck	Stake Body	1½ ton	Subsidiary	Rev.	Chevrolet
Chicago, Mil., St. P. & Pacific	1	Truck	Stake Body	1½ ton	Railroad	Co. Business	Ford
	1	Sedan	Tudor	5	Railroad	Co. Business	Chevrolet
	1	Sedan	Tudor	5	Railroad	Co. Business	Ford
Chicago, St. Paul, Minn. & Omaha	22	Truck	.....	3 ton	Subsidiary	Rev.	General Motors
	1	Tractor	.....	.....	Subsidiary	Rev.	General Motors
	1	Tractor	.....	.....	Subsidiary	Rev.	Reo
	1	Trailer	.....	.....	Subsidiary	Rev.	Reo
Delaware, Lackawanna & Western	1	Truck	Mode A	.....	Railroad	Co. Business	Ford
	2	Truck	Model AA	.....	Railroad	Co. Business	Ford
Delaware Valley	1	M. Coach	Parlor	25	Subsidiary	Rev.	General Motors
	1	M. Coach	City	25	Subsidiary	Rev.	General Motors
East Broad Top	1	M. Coach	Interurban	25	Subsidiary	Rev.	A. C. F. Motors
East Tennessee & Western N. Carolina Motor Transportation Company	2	M. Coach	Parlor	25	.....	Rev.	White
	1	Truck	.....	5 ton	.....	Rev.	White
	1	Tractor	.....	.....	.....	Rev.	White
	1	Trailer	.....	.....	.....	Rev.	White
Fonda, Johnstown & Gloversville	3	M. Coach	City	16	Railroad	Rev.	Mack
Greyhound Management Company	66	M. Coach	.....	.....	.....	Rev.	General Motors
	15	M. Coach	.....	.....	.....	Rev.	Mack
	5	M. Coach	.....	.....	.....	Rev.	White
Illinois Central	1	M. Coach	Parlor	29	Subsidiary	Rev.	General Motors
Lehigh Valley	1	Truck	Open Body	½ ton	Railroad	Co. Business	Ford
Los Angeles & Salt Lake	1	Truck	Model AA	1½ ton	Railroad	Co. Business	Ford
Maine Central	4	M. Coach	Observation	33	Subsidiary	Rev.	General Motors
	1	Truck	Stake Body	5 ton	Subsidiary	Rev.	Diamond T
Missouri Pacific	5	M. Coach	Parlor	29	Subsidiary	Rev.	.....
Monongahela	2	Truck	.....	1½ ton	Railroad	Co. Business	Ford
New Orleans Great Northern	1	M. Coach	Pass. & Bagg.	14	Railroad	Rev.	White
New York, New Haven & Hartford	2	Truck	Stake-Dump	3½ ton	Railroad	Co. Business	Dodge
	1	Truck	Dump	1½ ton	Railroad	Co. Business	Chevrolet
	1	Truck	Canopy	2 ton	Railroad	Co. Business	Dodge
	32	M. Coach	.....	33	Subsidiary	Rev.	General Motors
	20	Tractors	.....	10 ton	Subsidiary	Rev.	General Motors
	6	Tractors	.....	10¾ ton	Subsidiary	Rev.	Brockway
	5	Tractors	.....	10½ ton	Subsidiary	Rev.	Diamond T
	6	Tractors	.....	10¼ ton	Subsidiary	Rev.	Pierce Arrow
	58	Semi-Trailer	.....	10 ton	Subsidiary	Rev.	General Motors
Norfolk & Western	2	Truck	Model A	¾ ton	Railroad	Co. Business	Ford
Norfolk Southern	1	M. Coach	Interstate	29	Subsidiary	Rev.	Mack
Pacific Electric	23	M. Coach	City	28	Railroad	Rev.	Fageol Motor
	12	M. Coach	City	28	Railroad	Rev.	Twin Coach
	7	M. Coach	City	25	Subsidiary	Rev.	General Motors
	1	Truck	Model AA	1½ ton	Subsidiary	Rev.	Ford
	3	Truck	.....	3 ton	Subsidiary	Rev.	Federal
Pacific Greyhound Lines	12	M. Coach	Parlor	33-40	.....	Rev.	General Motors
	6	M. Coach	Duplex	53	.....	Rev.	Pickwick
Pennsylvania	2	Truck	.....	1½ ton	Railroad	Co. Business	.....
	1	Truck	.....	½ ton	Railroad	Co. Business	.....
	4	Sedan	.....	5	Railroad	Co. Business	.....
	1	Trailer	.....	.....	Railroad	Co. Business	.....
Pennsylvania Greyhound Lines	30	M. Coach	Parlor	33	.....	Rev.	Yellow
Portland Terminal Company	1	Truck	Low Body	1½ ton	Railroad	Co. Business	Ford
Railway Express Agency	568	Truck	.....	Light duty	.....	Rev.	.....
	104	Truck	.....	Heavy duty	.....	Rev.	.....
	111	Truck	Electric	Heavy duty	.....	Rev.	.....
	11	Tractor	.....	.....	.....	Rev.	.....
	1	Trailer	.....	.....	.....	Rev.	.....
Reading	1	M. Coach	Parlor	33	Subsidiary	Rev.	Mack
	1	M. Coach	Parlor	33	Subsidiary	Rev.	A. C. F. Motors
	1	M. Coach	Parlor	33	Subsidiary	Rev.	General Motors
	2	M. Coach	Parlor	21	Subsidiary	Rev.	Fargo Motor
Richmond-Greyhound Lines	2	M. Coach	Observation	33	.....	Rev.	General Motors
Richmond, Fredericksburg & Potomac	2	Truck	.....	5 ton	Subsidiary	Rev.	White
St. Louis Southwestern	2	M. Coach	Parlor	35	Subsidiary	Rev.	Fargo Motor
	2	Sedan	.....	5	Subsidiary	Co. Business	Dodge
Sandy River & Rangeley Lakes	1	Truck	.....	.....	Railroad	Rev.	Ford
Southern	1	Truck	.....	¼ ton	Railroad	Co. Business	Ford
Southland Greyhound Lines	6	M. Coach	Parlor	29	.....	Rev.	General Motors
Spokane, Portland & Seattle	1	M. Coach	Parlor	13	Subsidiary	Rev.	Reo
Union Pacific	1	Truck	.....	1½ ton	Railroad	Co. Business	Chevrolet
Virginia & Truckee	2	M. Coach	Pass & Frt.	10 Pass.-2 ton	Subsidiary	Rev.	Fageol Motor

Statistical Section Continued on Second Left Hand Page Following



LOWER
» » With

ACATHON STEELS

AGATHON ALLOY STEELS
where toughness, strength or lighter weight are needed.

TONCAN COPPER
Mo-lyb-den-um
IRON

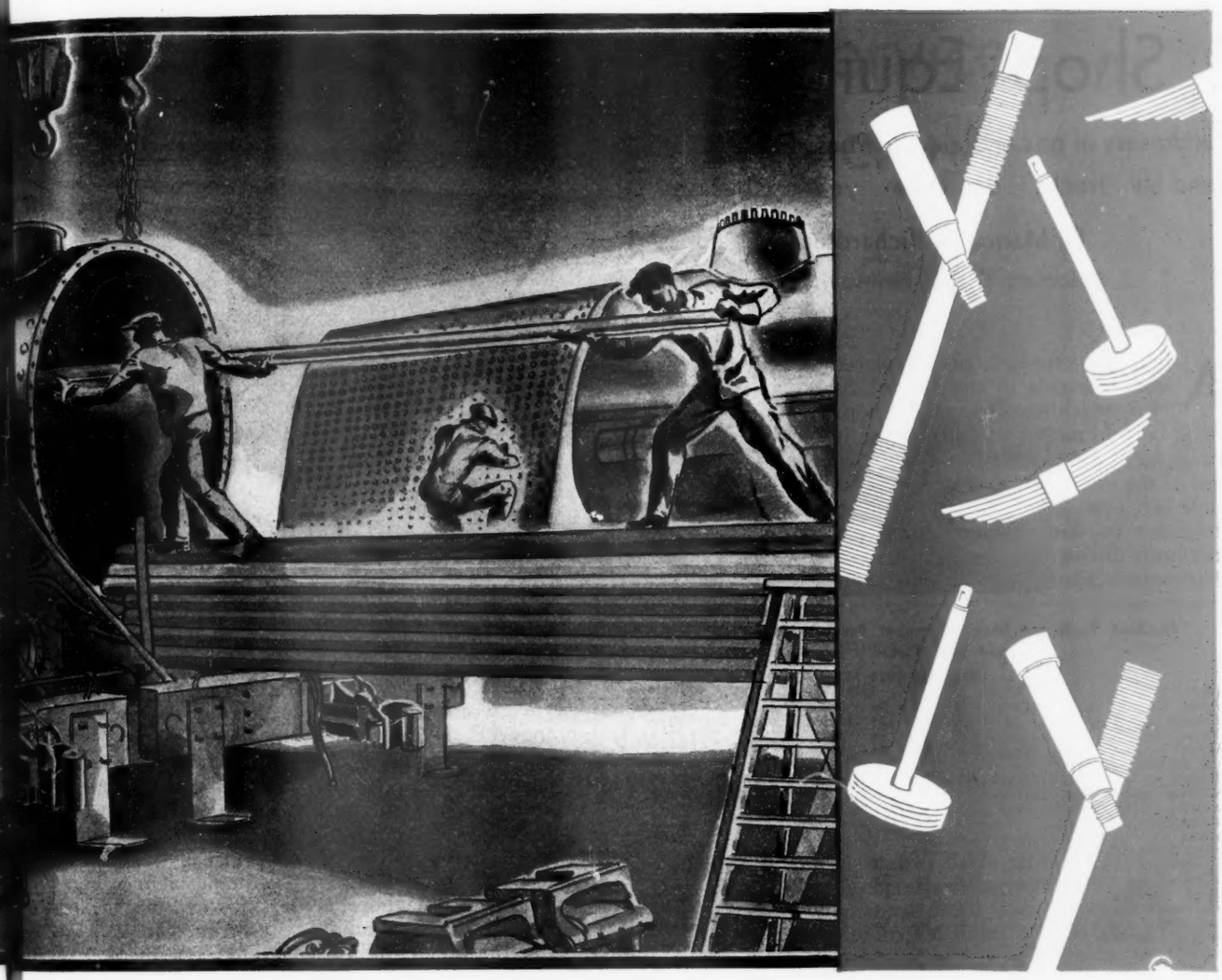
TONCAN IRON
where rust and corrosion threaten

REDUCE repair costs by using longer-lasting materials. Ordinary carbon steel has given way to alloy steels and irons that possess superior physical properties. Greater strength, greater fatigue and corrosion resistance and lighter weight are obtainable in the alloys developed specifically for railroad work by the metallurgists of Republic Steel Corporation. Make full use of these modern materials and keep equipment out of the shops.

For case-hardened parts Agathon Nickel Iron provides a far tougher core which means fewer breakages.

Where axles, rods and pins encounter higher stresses, there are Agathon Alloy Steels of greater strength and fatigue resistance to meet the new demands.

Alloy staybolts of both steel and iron are furnished by Republic



MAINTENANCE

Better Materials « «

To supply the increased fatigue resistance and greater uniformity of composition that reduce staybolt breakage.

In Toncan Iron, the metallurgists of Republic Steel Corporation have developed a material of unusual usefulness to the railroads.

Toncan Iron boiler tubes are easily worked. Moreover, they have an increased corrosion resistance that results from alloying refined iron, copper and molybdenum.

This same superior corrosion resistance makes Toncan Iron preferred for firebox sheets, car plates, and everywhere that corrosion is troublesome.

Use these better materials to control the rising tide of equipment maintenance.

CENTRAL ALLOY DIVISION
REPUBLIC STEEL
CORPORATION
Massillon, Ohio

Shop Equipment Orders in 1931

Purchasers of gas and electric trucks, trailers and hand-lift trucks dominate year's business

By Marion B. Richardson
Associate Editor, Railway Age

AS to be expected, orders placed during 1931 by the railroads in the United States and Canada for machine tools and shop equipment were small, both in number of orders and in number of units per order. One hundred and one roads—about 96 per cent of the total route mileage—reported their purchases made last year. Of the 101 reporting roads, 54 reported purchases of one or more units. Forty-six made no purchases during the year.

Seventeen roads, representing nearly 22 per cent of the total route mileage, placed orders for 10 or more units during the year. The larger part of these orders was for material-handling equipment. A total of 18 railroads placed orders for power trucks and trailers. Fifty-three power trucks were ordered, of which the large majority were of the elevating-lift type or were equipped with cranes. Of the total number ordered, 26 were electric and 27 gasoline-engine driven. The number of trailers ordered last year, a total of 234, is the largest number ordered any year since 1924, with the exception of 1928 and 1930 when 395 and 785 were ordered, respectively. As an indication of the attention which mechanical-department officers are giving to the problem of handling materials in the shops, 9,785 skids of a variety of box and platform construction were ordered in 1931 in addition to the other material-handling equipment.

Although the orders in 1931 for machine tools did not amount to much, still the comparative distribution of units, as shown in the vertical columns of the table under each year, bear a striking proportional similarity. Of the 56 items listed in the table, only four show blank spaces for 1931. Orders for grinding machines dominate the tool groups with a total of 77, of which 54 are floor grinders. Of the heavier types of machine tools, engine lathes, vertical drill presses, vertical boring mills and horizontal milling machines predominate. Orders for miscellaneous forging machines compare favorably with previous years, except 1929, 1926 and 1924.

Much of the purchasing done by the railroads during the year was for shop-equipment units not listed in the table. A considerable number of spray-painting equipments; water pumps, the most of which were for boiler washing; units for electrical shops; shop power, etc; jacks of large capacity for car and locomotive repair work; locomotive drafting units, and locomotive pullers were ordered last year. In addition, a number of units were ordered for installation in oil and waste renovating plants. Several railroads installed hot-water boiler washing plants. Some of the shop-equipment units ordered were for the precooling of passenger cars.

The continuance of the business slump from 1929 through 1931 makes any attempt to indicate trends with respect to purchases made in 1930 and 1931 worthless. There are, however, two important developments that will bear watching; namely, progress in material handling, and the effect that such developments as the increased utilization of modern power is having on shop practices and equipment.

Machine Tools and Shop Equipment Purchased Over an Eight-Year Period

	1931	1930	1929	1928	1927	1926	1925	1924
Lathes								
Axle	2	25	36	28	27	72	47	35
Engine	13	84	134	115	149	236	178	209
Turret	4	24	48	38	33	55	51	93
Wheel	6	24	25	11	14	32	34	26
Drill Presses								
Radial	5	31	42	31	48	93	65	71
Vertical and others	17	35	121	63	92	203	114	107
Planers	1	13	49	12	23	39	25	40
Shapers	7	20	53	42	46	75	70	74
Slotters	4	2	11	6	8	7	9	13
Boring Mills								
Horizontal	1	4	7	8	4	13	13	16
Vertical and others	5	31	53	46	49	93	56	64
Milling Machines								
Universal	1	2	4	5	8	26	15	18
Horizontal and others	8	16	53	24	19	37	23	32
Grinding machines								
Cylindrical	9	2	8	13	10	20	9	13
Internal	8	8	13	27	32	20	36	20
Surface	6	1	27	10	10	22	14	17
Double end, tool and others	54	182	258	224	236	346	232	190
Metal-cutting saws	7	28	35	29	31	68	40	36
Portable boring, facing and turning machines	21	29	30	34	29	80	58	51
Bolt threaders and cutters	9	13	43	27	30	54	53	54
Pipe threaders and cutters	10	22	50	35	45	66	40	42
Presses								
Wheel	3	20	13	4	17	24	22	20
Others	5	30	33	50	42	74	60	58
Hammers								
Steam	3	7	8	18	12	37	34	19
Other power	3	13	15	21	18	24	10	12
Forging machines								
Bulldozers	..	4	5	2	9	5	6	11
Others	8	3.	20	3	5	20	6	12
Punches	1	3	10	10	4	30	15	13
Shears	11	18	36	42	23	72	31	41
Combination punch and shear	1	8	16	16	20	39	33	22
Flue Shop Machinery								
Flue welders	1	5	7	9	12	16	7	22
Miscellaneous	..	4	20	14	24	11	19	32
Boiler Shop Machinery								
Flangers	3	1	6	9	4	17	21	17
Forming rolls	..	3	12	9	9	14	9	12
Riveters	27	12	37	7	5	15	8	..
Blowers	10	37	40	53	37	100	97	..
Furnaces								
Oil	8	32	52	64	53	68	63	..
Electric and others	8	27	118	43	27	18	96	..
Woodworking Machinery								
Boring machines	1	4	15	11	12	9	8	10
Mortisers	..	5	15	9	11	21	16	13
Surfacers and jointers	3	23	16	18	15	43	17	17
Tenoners	1	4	13	7	5	11	11	12
Wood cutting saws	14	19	31	33	57	93	64	62
Others	12	25	40	32	24	39	44	32
Overhead cranes	10	17	81	39	32	50	23	..
Car and loco. hoists and drop tables	9	40	65	60	63	24	14	..
Hoists								
Air	21	84	66	75	53	116	101	..
Electric	18	82	177	44	56	54	51	..
Chain	18	34	30	42	85	41	78	..
Trucks								
Electric	26	71	64	90	55	98	114	..
Gas	27	66	126	65	33	76	17	..
Trailers	234	785	157	395	132	135	85	..
Air-Brake test racks	2	11	10	30	43	28	24	..
Air compressors	25	39	66	52	64	82	54	..
Motors	56	115	124	101	122	138	27	..
Electric welders	29	69	96	72	46	158	110	..

Statistical Section Continued on Second Right Hand Page Following

Communication Services Made More Efficient

Creosoted Yellow Pine Pole Line on the Rock Island Between Oklahoma City, Okla., and Shawnee

Construction of new facilities was limited but existing services were improved

By S. R. Hamilton

Associate Editor, Railway Age

ALTHOUGH existing communication facilities on most railroads are adequate to the demand imposed by prevailing business conditions, the year 1931 witnessed a fairly substantial increase in the installation of money-saving equipment. This fact is noticeable especially in the case of printing telegraph circuits and equipment, 59 machines and 5,217 miles of circuit having been installed in the last year. This increase, although not comparable with the higher figures for the preceding five years, is nevertheless gratifying in view of the comparatively low volume of traffic handled. Statistics covering 116 railroads throughout the United States and Canada indicate that, in general, only the most urgent new construction work was done during 1931, but that attention was concentrated on increasing the efficiency of existing services.

Table A—Principal Increases in Plant Facilities During 1931, as Compared with 1930 Increases

		1931	1930
Miles of new or rebuilt pole line:			
Railroad owned	2,412		
Commercially owned	2,223		
Jointly owned	1,693		
Total		6,328	9,024
Mileage of new copper wire:			
Railroad owned	10,322		
Commercially owned	6,644		
Total		16,966	43,503
Increase in miles of road dispatched by telephone		1,192	2,690
Increase in miles of long-distance telephone circuits		7,395	6,583
New mileage of telegraph circuits, all types		13,602	16,192
Increase in miles of printing telegraph circuits		5,217	6,857
Number of new printing telegraph machines		59	156

As Table A shows, the volume of plant facilities installed during 1931 varied from 38 to 112 per cent of that installed during 1930. The most favorable comparison is the increase of 7,395 miles of long-distance telephone circuits, which is 12 per cent greater than the increase of 6,583 miles in 1930. The importance of maintaining pole lines in good condition is indicated by the fact that a total of 6,328 miles of pole line—or 70 per cent of the corresponding figure for 1930—was rebuilt or newly constructed during the year. On the other hand, only 16,966 miles of new copper wire was installed, as compared with 43,503 miles for 1930.

Table B—Principal Copper Wire Installations Completed in 1931

Railroad	Miles of New Copper Wire: Railroad Owned	Commercially Owned	Total
C. B. & Q.	58	2,504	2,562
A. T. & S. F. (System)	1,560	173	1,733
M. P. (System)	944	622	1,566
C. P. R.	966	400	1,366
U. P. (System)	1,309	4	1,313
Erie	755	251	1,006
Penna.	935	44	979
G. N.	622	....	622
B. & M.	43	566	609
Wabash	....	609	609
C. & O.	580	....	580

Approximately 1,192 miles of road were converted to the telephone dispatching system. The Union Pacific alone extended this service on 501 miles of road, and the Canadian Pacific on 157 miles.

Printer Service Expands

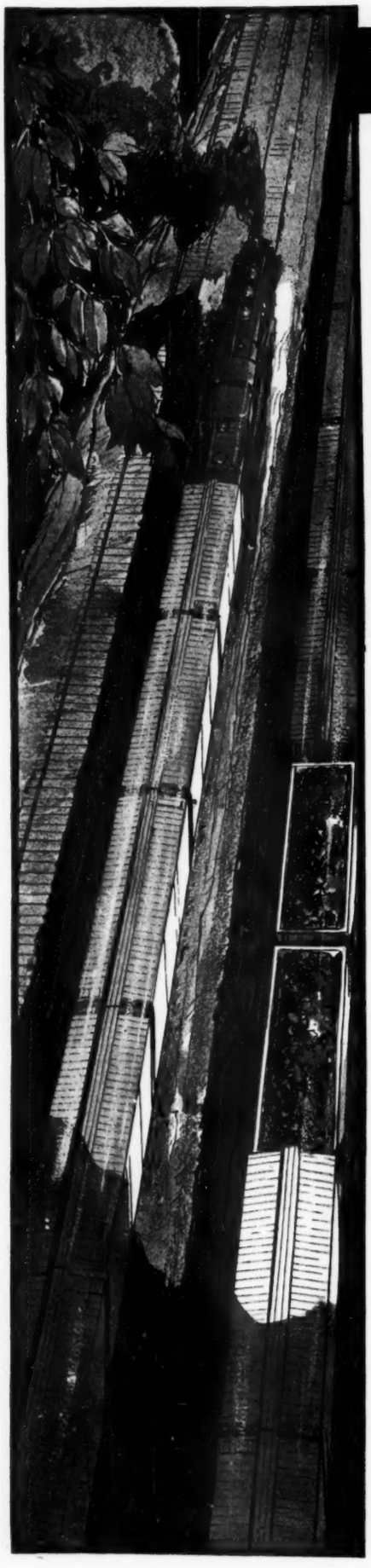
The Pennsylvania was most active in the installation of printers, adding 29 new machines and 1,442 miles of circuit to its already extensive printing telegraph sys-

Table C—Printing Telegraph Installations Completed in 1931

Road	Miles of Circuit	Number of Machines
Penna.	1,442	29
A. T. & S. F. (System)	618	18
C. P. R.	208	7
T. & N. O.	365	4
C. R. I. & P.	1,134	1
C. N. R.	1,450	..
Totals	5,217	59

(Continued on page 69)

Statistical Section Continued on Second Left Hand Page Following



▸ ▸ ▸ To Speed

ONLY moving cars can make a profit.

The failure of car parts in main line or switch yard service causes delays, limits train movement, piles up repair bills and damage claims—cuts down operating income.

National Draft Gears and National Trucks are designed, developed and manufactured to help eliminate costly delays and to speed up train operation.

Every step in the design and manufacture of these products is under the control of a single manufacturing organization. This unified control results in important economies which are passed on to our customers in improved quality and uniformity of our products.

We welcome inquiries and the opportunity to submit specifications and proposals to railway officials.

NATIONAL MALLEABLE AND STEEL CASTINGS CO.

General Offices: CLEVELAND, OHIO

Sales Offices: New York, Philadelphia, Washington, Chicago, St. Louis, San Francisco

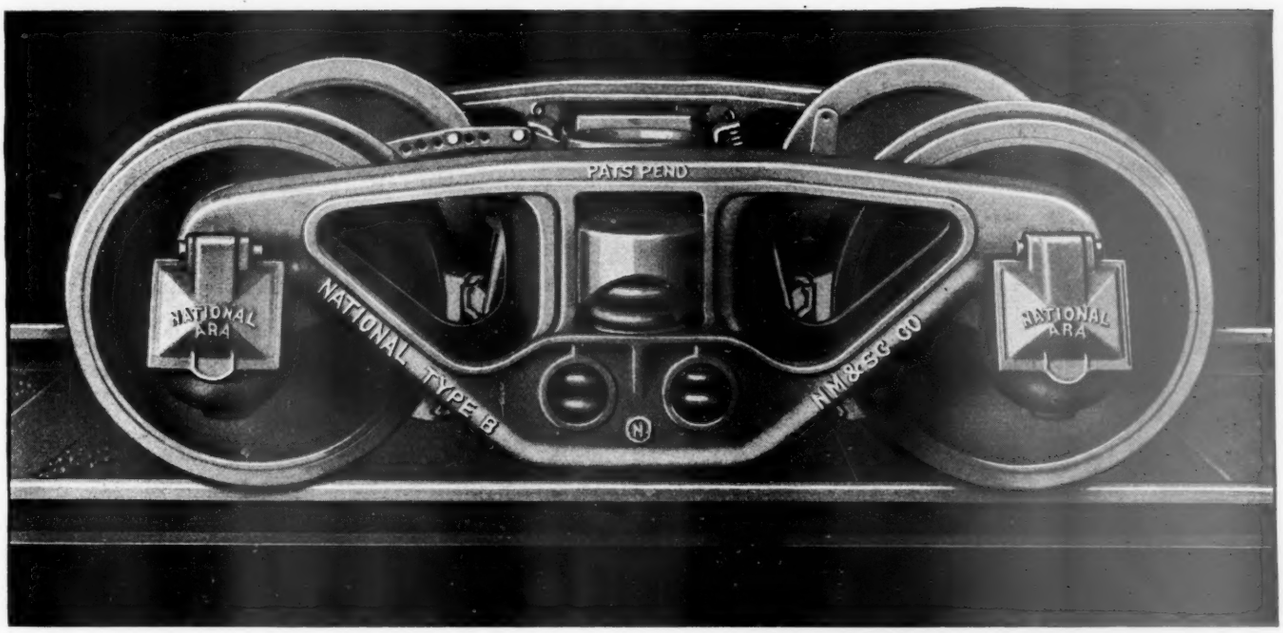
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.

NATIONAL

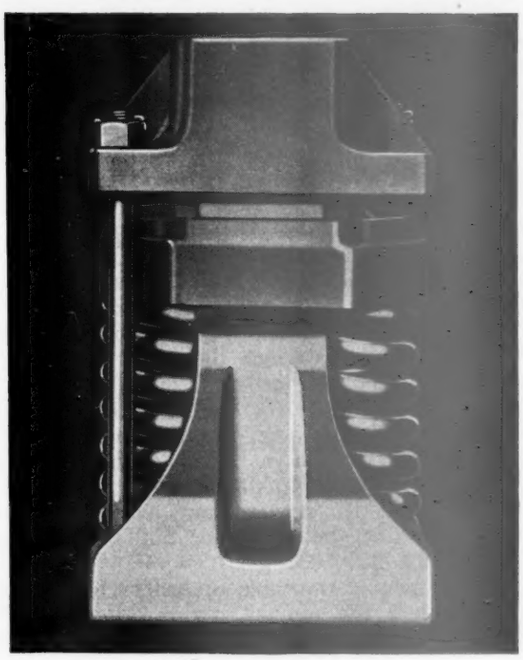
ELECTRIC NACO STEEL

DRAFT GEARS

Train Operation



National Type B trucks. Important operating advantages are secured in the National Type B truck. They provide increased strength, coupled with lighter weight, increased spring capacity, simplified design, fewer parts; and they permit quick wheel changes . . . All these advantages are secured without any premium in cost. Details gladly furnished on request.



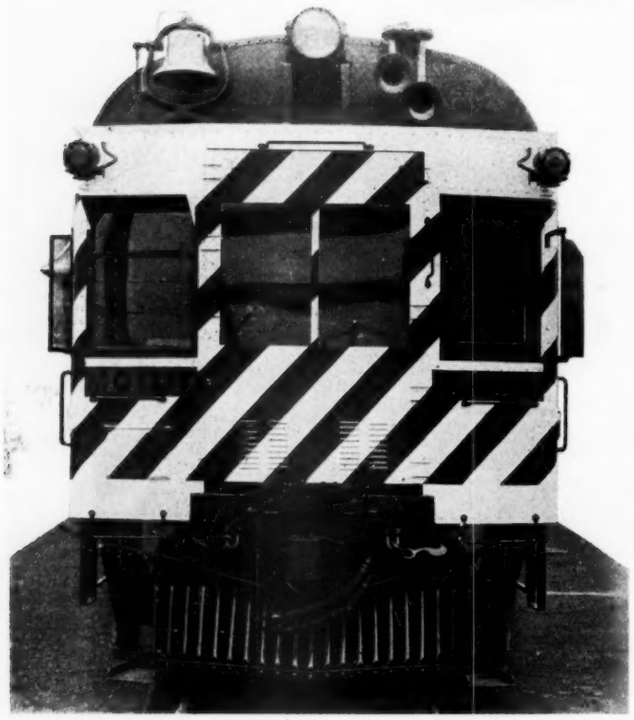
National M17 Naco steel draft gears. Official tests prove that these gears stand first in the combination of those qualities (capacity—sturdiness—endurance) essential to car protection and operation. Their rapidly increasing and continued use by leading roads for new cars and for replacement purposes absolutely verifies the findings of these official tests. Complete information furnished on request.

NATIONAL
TYPE B TRUCKS

Thirty Rail-Motor Cars Ordered Last Year

Twenty-three cars have power plants of 400 hp. capacity—One articulated car with 900-hp. plant—All 30 units have electric transmission

By Marion B. Richardson
Associate Editor, Railway Age



Santa Fe Gas-Electric Car Equipped With a Brill 535-hp. Power Plant—General Electric Transmission

THIRTY rail-motor cars were ordered by steam railroads from builders in the United States and Canada last year. For the first time since 1922, the first year for which these records were compiled, no trailer cars were ordered. The addition of ten rail-motor cars ordered for export brings the total of this type of rail equipment sold by manufacturers on this continent to 40. Five rail-motor cars ordered by the National Railways of Mexico are not included in the totals, as only the power plants were purchased in the United States, the cars being built in the shops of the company.

As shown in the table of orders for rail-motor cars and trailers, the number of cars ordered in 1931 is the lowest recorded. Of the 30 cars ordered, 22 have power plants of 400 hp. capacity and one has a plant of 300 hp. The one car listed in the 400- to 450-hp. group has a 415-hp. capacity power plant. Therefore, for all practical purposes 23 or 77 per cent of the total ordered for service on this continent have 400-hp. power plants.

Of the six rail-motor cars having power-plant capacities of 500 hp. and over, the 900-hp. car ordered by the Atchison, Topeka & Santa Fe from the Pullman Car & Manufacturing Corporation is the most notable. This is to be an articulated unit with Electro-Motive engines and General Electric transmission. Its estimated weight is 240,900 lb. The Santa Fe was the largest purchaser of rail-motor cars during the year, ordering a total of 16 units. Three of these are 550-hp. capacity cars, weighing 136,450 lb. each, which were built by the J. G. Brill Company. The remaining 12 cars ordered by the Santa Fe are of 400 hp. capacity.

Although the 1931 orders for rail-motor cars are small, the figures in the table showing the power-plant capacities indicate a continuance of the trend toward higher capacity units. In 1925, the figures for which year are not shown, the power-plant capacities of motor cars ordered were fairly well distributed between 100 or less and 250 hp. However, beginning with 1926, 65 of the cars ordered, or 54 per cent of the total, had power plants of over 200 hp. to and including 250 hp. The next highest horsepower group had 26 cars, or 22 per cent of the total.

These figures were practically reversed the following year, 1927, when 43, or 26 per cent of the total number ordered, had power plants of over 200 hp. and up to

Orders for Rail-Motor Cars and Trailers

	1923	1924	1925	1926	1927	1928	1929	1930	1931
For service in U. S.	77	120	149	142	180	175	132	54	26
For service in Canada	3	12	7	4	9	10	10	8	4
For export	22	..	34	32	12	9	28	3	10
Total	102	132	190	178	201	194	169	65	40
Motor cars	93	112	171	161	176	172	159	56	40
Trailers	9	20	19	17	25	22	11	9	..

Power-Plant Capacity of Rail-Motor Cars, U. S. and Canada

Horsepower	1926	1927	1928	1929	1930	1931
100 or less	14	2	5	6	2	..
Over 100 to and including 125	7	..	1	3	..	..
Over 125 to and including 150	..	..	4	1	..	..
Over 150 to and including 175	1	..	1	..	..	..
Over 175 to and including 200	3	3	1	..	..	..
Over 200 to and including 250	65	43	13	2	..	..
Over 250 to and including 300	26	76	64	15	7	1
Over 300 to and including 350	..	..	30	2	2	..
Over 350 to and including 400	..	..	18	64	25	22
Over 400 to and including 450	8	7	6	2	..	1
Over 450 to and including 500	11	1	4	5	..	..
Over 500	..	8	15	30	17	6
Unclassified	..	24	1	2	..	..

Comparison of Rail-Motor Weights, U. S. and Canada

Weights	1926	1927	1928	1929	1930	1931
25,000 lb. and under	7	..	3	3	..	..
Over 25,000 lb. to and including 50,000 lb.	7	..	4	6	..	..
Over 50,000 lb. to and including 75,000 lb.	2	4	4	..	2	..
Over 75,000 lb. to and including 100,000 lb.	79	29	16	5	..	..
Over 100,000 lb. to and including 125,000 lb.	32	88	62	20	2	..
Over 125,000 lb. to and including 150,000 lb.	5	21	58	54	29	25
Over 150,000 lb. to and including 175,000 lb.	..	..	11	24	13	4
Over 175,000 lb.	1	..	..	7	..	1
Unclassified	..	26	5	13	7	..

Continued on Next Left Hand Page

Make This Years Maintenance DOLLARS Haul More Tons

ESPECIALLY those dollars which will be spent for locomotive wearing materials—put 'em o work on a ton-mile basis.

Specify HUNT-SPILLER *Air Furnace* GUN-IRON for all the vital parts listed at the bottom of this page.

Its wear-resisting qualities will insure you greater mileage between renewals, more efficient locomotives, fewer failures, lower fuel consumption, and a big savings in the dollars formerly required for maintenance.

HUNT-SPILLER MFG. CORPORATION
J.G. Platt, Pres. & Gen. Mgr. V.W. Ellet, Vice-President.

Office & Works
383 Dorchester Ave. South Boston, 27, Mass.

Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HSGI
Reg. U. S. Trade Mark

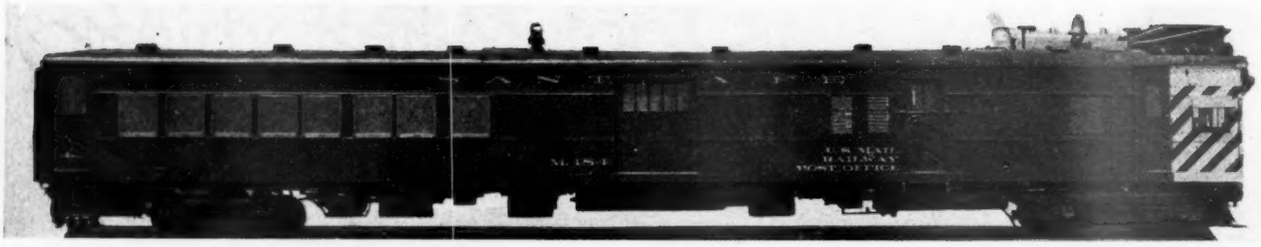
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings

Parts Finished for Application

Dunbar Sectional Type Packing
Duplex Sectional Type Packing
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER GUN IRON

Air Furnace



Eighty-Foot Gas-Electric Motor Car Built by Pullman—Equipped With 400-hp. Electro-Motive Power Plant

250 hp., and 76, or 46 per cent, had power plants ranging between 250 and 300 hp. The year 1928 saw a big step toward higher powered units when 27 per cent of the motor cars ordered for service in the United States and Canada had power plants rated at over 350 hp. In 1929, when 142 motor cars and trailers were ordered, over 76 per cent of the motor cars had power plants exceeding 350 hp. The larger percentage of the motor cars ordered during 1930 and 1931 had power plants of around 400 hp. capacity, with the next largest percentage having plant capacities of over 500 hp.

The weights of 25 of the 30 cars ordered for service in the United States and Canada fall between 125,000 and 150,000 lb. Four cars have weights ranging between 150,000 and 175,000 lb. One of the tables shows the distribution of the motor cars by weight since 1926.

All of the cars ordered during 1931 for service by the steam railroads on this continent have gas-electric power plants. No oil-electric units were ordered last year.

Following is a list of the orders for rail-motor cars placed with the builders in the United States and Canada during 1930:

Orders for Rail Motor Cars and Trailers

For Service in the United States

Purchaser	No.	Motor or Trailer	Type of power plant	Horse-power	Seating capacity	Length of bagg. compt. Ft.	In.	Weight	Builders
Atchison, Topeka & Santa Fe....	3	Motor	Gas-Electric	550	..	48	11⅞	136,450	Brill-G. E.
	4	Motor	Gas-Electric	400	28	33	6	134,000	Elec.-M.-Pullman
	5	Motor	Gas-Electric	400	..	43	3⅞	133,400	Elec.-M.-West.-Pullman
	1	Artic.	Gas-Electric	900	..	53	2⅜	240,900	Elec.-M.-G. E.-Pullman
	3	Motor	Gas-Electric	400	..	43	3⅞	133,400	Elec.-M.-Pullman
Cleveland, Cin., Chi. & St. Louis	2	Motor	Gas-Electric	535	..	44	6	135,050	Brill-G. E.
Minneapolis & St. Louis.....	1	Motor	Gas-Electric	300	32	22	2	130,000	Elec.-M.-St. Louis
	1	Motor	Gas-Electric	400	..	29	1	146,000	Elec.-M.-G. E.-St. Louis
	2	Motor	Gas-Electric	400	..	44	0	145,000	Elec.-M.-G. E.-St. Louis
Missouri-Kansas-Texas	1	Motor	Gas-Electric	415	..	44	0	157,000	Brill-West.-St. Louis
	1	Motor	Gas-Electric	400	..	44	0	150,000	Elec.-M.-G. E.-St. Louis
Missouri Pacific	2	Motor	Gas-Electric	400	..	28	4¼	157,000	Elec.-M.-G. E.-St. Louis
Export									
Consolidated R. R. of Cuba.....	5	Motor	Gasoline	85	56	7	0	31,520	Brill-Hall-Scott
National Rys. of Mexico.....	*5	Motor	Gasoline	84	39	4	6	29,800	White-Company Shop
Uruguayan State Rys.....	5	Motor	Gasoline	85	43	7	0	30,820	Brill-Hall-Scott
Canada									
Canadian Pacific	2	Motor	Gas-Electric	400	50	20	2	142,000	Elec.-M.-West.-Ottawa Car
	2	Motor	Gas-Electric	400	25	34	6	142,000	Elec.-M.-West.-Ottawa Car

* Not included in totals.

Communication Services

(Continued from page 67)

tem. On the Santa Fe (System) 18 new machines and 618 miles of circuit were added to printer service. Other roads which engaged in this type of construction were the Canadian Pacific, the Texas & New Orleans, the Rock Island, and the Canadian National.

A notable installation of communication cables was completed on the Reading, in connection with that road's electrification program. A total of 95 miles of cable, varying in size from 11- to 99-pair, was put in service along the electrified lines in the vicinity of Philadelphia and its suburbs.

One of the largest communication construction projects under way at the present time is on the Pennsylvania between New Brunswick, N. J., and Trenton, and between Wilmington, Del., and Washington, D. C., in connection with the extensive electrification program being carried out on that road. An underground conduit is being constructed, which, when complete, will carry all the communication and signaling wires for a distance of 225 miles between New York and Washington.

As to the future, with the increasing attention that is being given to carrier-current systems of telegraphy and telephony, it is to be expected that as soon as business conditions warrant, the construction of this facility will receive a decided impetus Also, the use of teletypes for yard and terminal operation has been extended and should receive increasing attention in the future. Printing telegraphy, too, promises to provide a greater field of construction activity as soon as business picks up sufficiently to tax the capacity of existing communication facilities.

News Department Appears on Next Left Hand Page

PASSENGER-BAGGAGE CAR BUILT FOR CHESAPEAKE & OHIO RAILWAY

PRESSED STEEL CAR COMPANY

BUILDERS OF

FREIGHT AND PASSENGER CARS

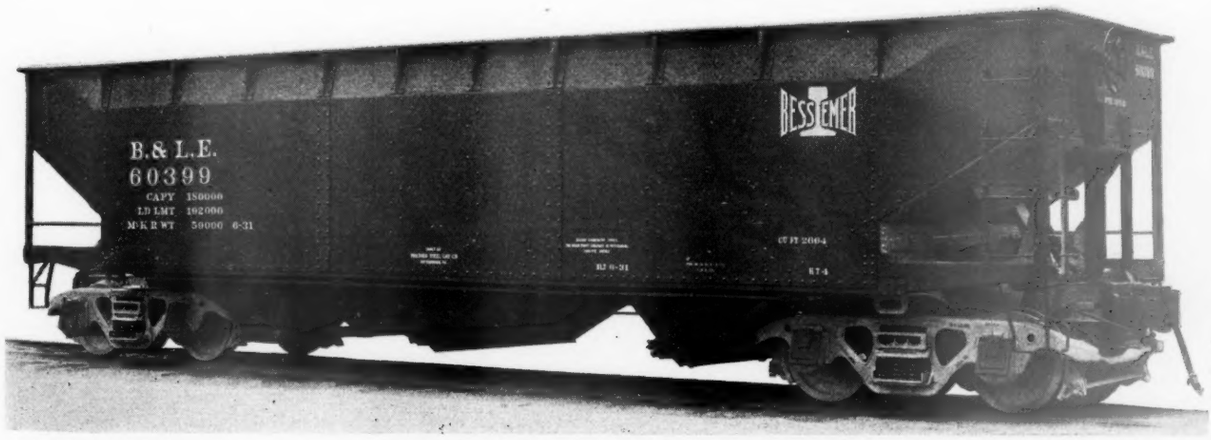
KOPPEL AUTOMATIC AIR DUMP CARS

TANK CARS

COMPLETE FACILITIES FOR REPAIRING CARS

STEEL UNDERFRAMES — CAST STEEL BOLSTERS and SIDE FRAMES—
PRESSED PARTS—MALLEABLE AND STEEL CASTINGS
CHILLED TREAD WHEELS—FORGINGS

NEW YORK PITTSBURGH CHICAGO ST. LOUIS ST. PAUL



90 TON CAPACITY HOPPER CAR B UILT FOR BESSEMER & LAKE ERIE R. R.

NEWS

Rate Increase to Become Effective January 4

The $100,000,000 temporary emergency increase in freight rates authorized by the Interstate Commerce Commission as a substitute for the 15 per cent increase asked by the railroads will become effective on January 4 as the result of a special permission order issued by the commission on December 24 authorizing the publication of the necessary tariffs on five days' notice. The rates are to expire on March 31, 1933. Tariff-publishing agents of the railroads had been in Washington working on the details of the special tariffs and in conference with the commission on them for several days and it had been hoped to make the effective date January 1, but because of the enorous amount of physical work necessary and the intervention of so many holidays, it was found necessary to adopt the later date. The applications for sixth section permission to make the increases effective on less than statutory notice were filed on December 24 and granted by the commission later in the day.

It was necessary for the commission to issue the following orders:

1. An order in Ex Parte No. 103 modifying all outstanding unexpired orders of the Commission to the extent necessary to permit the increases authorized in said decisions to be established.

2. Relief from the long-and-short-haul provisions of the fourth section of the interstate commerce act to the extent necessary to permit the increases authorized in said proceeding to be established, such relief to expire March 31, 1933.

3. A special permission under section 6 of the interstate commerce act waiving certain tariff rules so as to enable the authorized increases to be published in master tariffs and special supplements, and authorizing the establishment of the authorized increased charges on not less than five days' posting and filing as required by law.

The increases are covered in a "master" tariff applying for account of all carriers as shown in tariffs and supplements thereto making specific reference to it and will be applicable only in connection with tariff publications making specific reference to the master tariff and to the extent indicated in such tariff publications. The increases, of 1 and 2 cents per hundred pounds or 6 and 12 cents per ton (adopted in place of the original proposal for increases of $3 and $6 a car) are shown in columns after the names of the various commodities headed "emergency charge rates."

As to tidewater coal, which moves to Hampton Roads by rail, thence by water to New England, and thence inland by another rail movement, it has been arranged by the carriers that but one emergency increase shall be applied, to the initial rail movement, and an agreement will be reached among the carriers for a division of the amount with the New England lines. A similar arrangement is under consideration for lake cargo coal and iron ore which are handled in two separate rail hauls broken by a lake movement but because lake navigation is now closed it was not necessary to complete the arrangement at this time.

Porter Elected Chairman of I. C. C.

Pursuant to its policy of having its various members serve as chairman in rotation, the Interstate Commerce Commission has elected Commissioner C. R. Porter as its presiding officer for the year 1932 to succeed Ezra Brainerd, Jr.

Fire at P. R. R. Altoona Shops

Fire causing an estimated loss of between $1,500,000 and $2,200,000 destroyed the central section of the Altoona machine shops, a unit of the Pennsylvania's Altoona (Pa.) works, on the morning of December 27. The departments destroyed were the bolt, telegraph, electric, air brake, machine and two erecting shops.

D. L. & W. Suburban Fare Increase Authorized

Increases of 15 to 25 per cent in commutation fares on the lines of the Delaware, Lackawanna & Western between points in New Jersey and New York city, which had been suspended by the Interstate Commerce Commission, were found justified by the commission in a report made public on December 24, accompanied by an order vacating its suspension. The increases were to have become effective on November 1, 1930, but were suspended on protests filed by representatives of the communities affected and were later voluntarily suspended by the company until January 1. The company had submitted cost studies estimating the loss in the operation of commutation service at $539,000 a year, whereas a return of 5.75 per cent on the investment of $28,582,333 would be $1,643,484. The amount of the increases was estimated at $649,335, leaving a deficiency of $1,533,149. While exceptions were taken by protestants to the cost studies the report says that it is not considered that if all the exceptions were stated in amounts they would eliminate the loss shown inclusive of a fair return.

Favorable Prospects for Finance Corporation Bill

A favorable report on the Walcott bill providing for the creation of the Reconstruction Finance Corporation, one of whose functions will be to make loans to railways unable to obtain funds upon reasonable terms through ordinary channels, was voted by the sub-committee of the Senate committee on banking and currency at an evening session on December 22, following the hearings which were reported in last week's issue. Some amendments were favored by the sub-committee, one of which will probably be a provision requiring the Interstate Commerce Commission to pass on the railway applications for loans and issue certificates approving them, thereby disposing of Senator Couzens' proposal that the $300,000,000 revolving fund of Section 210 of the transportation act be revived. Members of the sub-committee and bankers who testified before it expressed a preference for a single loan fund, to which railways might have access, over the idea of establishing a separate fund.

Alfred P. Thom, general counsel of the Association of Railway Executives, testified briefly at the final session of the hearings, urging the importance of prompt action. He referred to the testimony of Chairman Brainerd of the commission showing that the railways have $156,000,000 of obligations maturing in the first four months of 1932 and pointed out that no funds to be collected by the Railroad Credit Corporation from the temporary freight rate advance will be available for loans until some time in March. He said the railways had no objection to the suggestion that the commission pass upon the loans and recalled Chairman Brainerd's statement that the commission could do so in a week if necessary.

Receivers Endeavor to Secure Wabash Funds

United States District Judge Davis of St. Louis, Mo., has continued until January 15 the hearing on a court order for the First National Bank in St. Louis and the Mercantile-Commerce Bank & Trust Company to show cause why an injunction should not be issued against them for failure to turn over to the receivers for the Wabash certain funds on deposit at the time the railroad went into receivership. In their answers filed with the court, the banks take the position that the Federal courts lack jurisdiction, and also that the banks would be deprived of their constitutional guarantee if forced to turn over the deposits of the Wabash.